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TIMES LONDON FUTURE OF NAVIES

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FUTURE *of* NAVIES GREAT SHIPS *or* — ?



Leading Articles reprinted from

The Times

with Letters from

Admiral SIR PERCY SCOTT
and others.

LONDON:

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THE FUTURE OF NAVIES.

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THE FUTURE of NAVIES

Great Ships or — ?

At the beginning of December, 1920, a correspondence was opened in the columns of "The Times" on the subject of capital ships and the extent of their usefulness in modern naval warfare. The discussion, which quickly ripened into a controversy between those who believe in big ships and guns, on the one side, or in submarines, aircraft, and torpedoes, on the other, arose out of a leading article published on November 29, under the title of "The Navy: A Question for the Nation." In this it was pointed out that, in consequence of the building programmes announced by the United States and Japan, the British Fleet in a very few years would be relegated from the first to the third place, reckoned by capital ships, among the fleets of the world. Capital ships, it was recognized, may no longer be the measure of naval power, but the country had no means of judging whether this was or was not the view held by the Admiralty. All that it knew for certain was that it costs about £9,000,000 and takes about three years to build a capital ship, and that since the Armistice none had been laid down.

In view of the interest excited by the discussion, it has been decided to republish the correspondence and articles in connected form, together with brief notes on the various steps taken by the Government in dealing with this great and difficult problem, on the proper solution of which, more, perhaps, than any other decision which they are called upon to make, depends the whole future security of the Nation and the Empire.

THE NAVY: A QUESTION FOR THE NATION.

Leading Article, "The Times"
(November 29, 1920).

Since the Armistice, Navy policy has been in abeyance. The minor economies for which the First Lord, MR. WALTER LONG, from time to time ingenuously takes credit to himself and to the Board of Admiralty, have engrossed attention, and the construction of new capital ships has been wholly suspended. We are not indifferent to the economies that the Admiralty have effected. It is something in these days that one of the great spending Departments should have been able to reduce its *personnel* to considerably less than before the war; and if the Vote for that reduced *personnel* is still nearly twenty millions above the total of 1914-1915,

there are evident reasons for the excess, at which none will cavil, in increased pay and allowances. But complacency at the Board of Admiralty is apt to be an ominous thing; and self-praise by the FIRST LORD on its behalf inspires uneasiness. Last week, SIR PERCY SCOTT put into words one of the reasons for this uneasiness. What is to be the construction policy of the Board? The United States and Japan are carrying out far-reaching programmes of capital ship construction. If the British Admiralty hold to their present policy of inaction in construction, Great Britain will, in some three years' time, be the third naval Power in tonnage of capital ships. This country has no battleship which wholly embodies the lessons of the Jutland battle, though modifications in the design of the "Hood" were made after the battle. The Fleet is a pre-Jutland Fleet;

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whereas both in the United States and Japan there are building capital ships as superior to the pre-Jutland ships of the British Navy as the Dreadnought was superior to any warship afloat in her day.

These facts reduce to their true proportions the recent utterances of the spokesmen of the Board of Admiralty upon economies. They are insignificant to the point of pettiness unless the Admiralty have a definite policy as regards construction. In the *arcana* of the Admiralty, plans may already exist for another revolution in naval shipbuilding as important as that effected by the production of the first Dreadnought. But we doubt it ; and even if it were true, we should still regard it as a matter requiring the gravest consideration. This country will not lightly return to that stealthy rivalry in naval armaments which it supported with difficulty before the war. Rivalry in actual building there may still have to be, and a measure of secrecy about plans and designs is a dictate of commonsense. But rivalry in the pre-war sense of hostile intention masked by every device of political protestation and espionage—for this there should be no place as between the United States, Great Britain, and Japan. Before the war the fleet of the United States was never reckoned by the British Admiralty as among the possibly hostile naval elements upon which the two-Power standard was based. The common achievements of the two fleets during the war—of which ADMIRAL SIRMS has just reminded both countries in his book—have certainly not weakened this tradition. So with Japan. She has long been our Ally; her great ships swept the oceans in close cooperation with ours throughout the war ; she shares the national pride of our island people in a great and formidable fleet. Yet we have to realize that, as matters now stand, events will relegate the British Fleet, in a very few years, to the third place, reckoned by capital ships, among the fleets of the world. Nothing, in a matter of this kind, can be more mischievous than over-reticence.

Defence by sea is still the very condition of the existence of the British Empire ; and the debt of the world to the pacific influence of the British Navy is wholly beyond calculation. Whether the continuance of these two great functions of the British Navy—the indispensable function of defence and the incidental, but indisputably valuable, function of policing the seas—can still be ensured

without the retention of the old primacy in capital ships cannot yet be determined. But the moment is at hand when it will have to be determined, for it is certain that the peoples of the whole Empire will sanction no Navy policy that should jeopardize their absolute security by sea. If security still depends upon a sufficiency of capital ships, then the peoples of the Empire will provide them, as their forefathers did, at whatever financial sacrifice. The duty of primary decision lies upon the Admiralty ; and it must be quick decision, for the Empire Peace Cabinet, when it meets in June, will expect to have adequate plans for Empire security by sea ready to its hand. Capital ships, too, cannot be built in a day, and if the British Navy is still to compete in their construction with other Powers, there is little time to lose. The cost in that event will be such as none can contemplate without reluctance, though determination will not waver before the cost if its necessity should be clear. Capital ships, however, may no longer be the decisive measure of naval power. If the views which SIR PERCY SCOTT expounded once again last week are correct, they are not. To draw from the inaction of the Admiralty in construction since the Armistice the conclusion that they share those views would be hazardous. But what is the policy of the Admiralty ? They should declare it at once, and with frankness about the principles upon which it is based. Bold candour now is indispensable if the British peoples are to judge aright as to Navy policy ; and the ultimate duty of judgment lies with them. In its international effects, too, candour by the British Admiralty at this juncture cannot fail to be of lasting service to the tranquillity of the world.

GUNS AND TORPEDOES.

From "Flag Officer" (December 1).

Sir,—The naval officers who have written on the subject of the Battle of Jutland have put the personal aspect of the controversy with great force and lucidity. But it may be doubted whether this is a matter of any great interest to the general public. What the public desire to know is whether any lesson can be learnt from the experience gained in the late war which will prove a guide to those who are responsible for framing the naval policy of the future, especially in view of the financial position of this country.

In any consideration of those occasions when capital ships were engaged, the following points stand out. On all these occasions the British

admirals went to sea with one idea only in their minds—viz., “to come up with the enemy wherever he could be found” and to destroy him. Taking the actions in chronological order, what do we find ?

In January, 1915, the British battle cruiser force was in pursuit of an enemy battle cruiser force ; every yard by which they could decrease the distance between the enemy and themselves was of vital importance, but they were forced by submarine menace to turn away, and so lose any real chance of accomplishing the destruction of the enemy. The British admiral had to be content with one ship—the Blucher. The torpedo menace had foiled the attack of the capital ship.

In Cradock's action off Coronel of November 15, as also in Sturdee's brilliant victory a month later, no torpedo craft were present, and gun action at long range was not interfered with by torpedo menace from either side.

At Jutland, the Commander-in-Chief, Grand Fleet, with considerable superiority in strength and tactical position, was forced to turn away by threat of attack by torpedo, and so lost touch with his enemy, which he did not afterwards regain. Thus for the second time attack by the capital ships by the superior force was foiled by torpedo attack by the weaker force ; one British battleship was hit with torpedo on this occasion.

Again, on August 19, 1916, Commander-in-Chief, Grand Fleet, with superior forces, was for the second time in contact with the enemy, and made the well-remembered signal, “I expect to be in action in a few moments, and have every confidence as to the result.” Immediately afterwards he was attacked by torpedo ; two light cruisers were sunk ; no battleships came into action, and within half an hour of the signal being made the Battle Fleet was steering for its base.

On each of these three occasions the torpedo proved a sure parry for the gun attack of the capital ship. The tactics employed by the British admirals on each occasion received the written approval of the Board of Admiralty, and must be assumed to be correct. The facts are incontrovertible, and the lesson to be learnt appears to be that the present type of capital ship is useless in the presence of hostile torpedo craft. This conclusion is of urgent and immediate importance, for two reasons.

There are now in commission some 20 of these useless vessels. Sir Percy Scott puts the annual cost of the upkeep of each at £120,000 ; he has probably under-estimated it. There are six of them in the Mediterranean. What are these ships for ? What useful purpose do they serve ? Who would they fight if they could, and who could they fight if they would ? There are also 12 capital ships in full commission in home waters, about which the same question may be asked.

Secondly, there are not wanting signs that we

may shortly see a Press campaign to support a policy of further battleship construction. The public should beware lest they are stampeded on this question. The designs of all fighting ships must be fundamentally reconsidered in the light of war experience, and not one shilling of public money should be voted until the obsolete battleships now in commission are withdrawn.

Yours truly,
FLAG OFFICER.

REPLIES TO “FLAG OFFICER.” From “R.N.” (December 3).

Sir,—The question of the battleship is one which calls, as you very truly observe, for close scrutiny and inquiry, not hasty action : but it is not to be solved by reasoning of the kind put forward by “Flag Officer.”

“Flag Officer” states what he claims to be “incontrovertible facts.” But the accuracy of his statements is open to question ; and even if what he avers to be facts should prove to be so, it is most decidedly doubtful whether they embrace a wide enough range to permit us to draw the sweeping conclusion that battleships are “useless.” It is impossible to decide upon a question of this nature from three tactical examples.

I should like your permission to examine “Flag Officer's” examples and reasoning. He tells us that at the Dogger Bank the submarine menace foiled the attack of the battle cruisers by forcing them to turn away. Sir David Beatty's dispatch reads that a turn to port was made in consequence of submarines being reported, and a periscope seen, on the starboard bow. But this was not the reason for breaking off chase, for the chase continued ; the attack was not foiled by this menace. What the reasons were for abandoning chase, after the Lion was disabled, have not been given, but until we know whether it was due to the falling astern of two of the other battle cruisers, to the neighbourhood of minefields, to destroyers or submarines, no one is entitled to assume that the torpedo proved a “sure parry” for the gun.

“Flag Officer” says that the tactics on this and on the other occasions to which he refers received the written approval of the Board of Admiralty and must be assumed to be correct. I presume he speaks with certain knowledge as to the approval. The outer signs, however, would lead me to draw a different conclusion, unless it was a pure matter of coincidence that the flag officer who took charge after the Lion's disablement was transferred to another command, remote from the main theatre of operations.

Even, however, if the Admiralty did approve the tactics, this does not furnish ground for the assumption that they were correct, unless we should make the further assumption that the

Admiralty was infallible. But this we know it was not. The Admiralty approved the dispositions that led to the loss of the *Cressy* ; it approved the Dardanelles. It approved the doctrine that destroyers with a fleet had the primary function of defending the fleet, and it approved the exact contrary—that their function was offensive. It approved with-drawing tactics, but it also approved the tactics of turning towards the enemy. How then is it possible to assume, when such errors were made, and such contrary doctrines approved, that their judgments can always be accepted as correct ?

"Flag Officer" next uses Jutland to prove the superiority of the torpedo. He says the British Fleet was forced to turn away. That it did turn away we are aware : but it has yet to be proved that it was necessary for it to do so. On this matter judgment is suspended until we know more of the action. But we do know that at a later date turning away was not considered necessary and that it was laid down that a torpedo attack would be met, if necessary, by turning towards the enemy. In the light of this later decision it is impossible to say that "Flag Officer's" contention can be upheld.

The third example given is that of August 19, 1916. We are told that the Fleet was attacked with torpedoes just as the Commander-in-Chief was expecting to come into action ; and we are left to infer, not only that the fleets were in contact, but that this torpedo attack was the cause of the Fleet returning to its base. This is grossly misleading. The fleets were not in contact ; and although a temporary turn was made, the reason was not to withdraw from a submarine attack, but to avoid mines. Lord Jellicoe is perfectly clear on this point :—

The first report indicated that she [the *Nottingham*, some 30 miles ahead of the Battle Fleet] had been hit by mines or torpedoes, and until it was clear that a *minesfield* did not exist it was prudent for the Fleet to avoid this locality, and course was accordingly reversed until it was ascertained that the damage was due to torpedoes ; when this became clear the southern course of the Fleet was shaped to pass to the eastward of the submarine.

The Fleet continued on a southerly course to a position at which it was hoped the High Sea Fleet would be met. It returned to its harbour when it became evident that the High Sea Fleet had turned back. It was not the submarines that turned the Grand Fleet back, though they deflected it from its course. The Fleet turned for home when it had no prospects of intercepting or overhauling the enemy fleet.

"Flag Officer" expresses the laudable desire that the public shall not be stampeded into a policy from which he differs ; and he attempts to stampede it in another direction on such flimsy evidence as this. To prove his ideas correct he selects three incidents, and these he misrepresents. Even if his representation and his deductions were correct, this would furnish but a small part of the lessons of a particular

theatre in a particular war. It is not upon such a limited view that large questions of policy can be decided.

"Flag Officer" derides the Battle Fleet. He ignores its influence. Let me suggest that if the enemy had possessed battleships and we had had none of these "useless" vessels, the East Coast and Scandinavian trades must have ceased, the flotilla on the Belgian coast, which was instrumental in checking the advance of the German Army and hampering the submarine war, would have been destroyed ; that there would have been nothing to prevent battleships and battle-cruisers from proceeding into the Atlantic (for their coal supply would have been enough if they were not threatened by the danger of superior force) and there stopping two operations of vital importance—the supply of food and other necessities to this country, and the transport of troops in the Atlantic. Submarines in open waters would no more have been able to prevent this than they were able to prevent the Tenth Cruiser Squadron from remaining continuously at sea in a belt nearer the German ports than the Atlantic lines of passage.

"Flag Officer" asks what use the Mediterranean Squadron serves. Such a question is natural from an officer who imagines that he can measure the importance of the battleship by some unverified references to three tactical situations.

I would suggest that if he is confident in his opinions he would serve the State better by setting out his views in a reasoned manner, and communicating them to the Admiralty, who, I make no doubt, would be only too glad to hear reasoning on all sides in this supremely important matter. Nothing, we may be sure, would please them more than to be convinced that other nations are wasting their money and that it is possible for us to maintain our maritime superiority at a comparatively small cost. But he will not achieve his end by shrill cries to the public not to vote money until his own views are accepted.

I am, Sir, yours, &c.,

R.N.

From "Naval Staff Officer" (December 3).

Sir,—The arguments put forward by your correspondent "Flag Officer" in your issue of December 1 are so fallacious that they should not be permitted to pass without refutation. He based his contentions that the torpedo and submarines have killed the capital ship on three main occurrences :—

1. The Dogger Bank action in January, 1915 ; in which he states that our battle cruisers were forced to give up the pursuit of Hipper's squadron owing to the menace of submarines.

2. Jutland.

3. The incident of August 19, 1916, in which he attributes the return of the Grand Fleet to its base to the fact that two of our light cruisers had been torpedoed by submarines.

It is a well-known fact that proximity to German minefields was the dominant factor in the decision to abandon the chase in the Dogger Bank affair—although the danger, possibly, was not so imminent as it was thought to be at the time. This disposes of the torpedo and submarine menace in that particular case.

At Jutland, steps were certainly taken to minimize the danger from a concentrated torpedo attack. The fact, however, that the Commander-in-Chief of the Grand Fleet did not hesitate to steer towards the enemy's base, and therefore towards increasing danger from torpedo and submarine, in order to engage the enemy the next day, does not bear out the contention that the torpedo dominated the situation.

As regards the incident of August 19, 1916, there is not an atom of evidence to bear out the suggestion that the threat of submarine attack forced the Grand Fleet back to harbour. The Grand Fleet returned to its base when it became known that Admiral Scheer had, on becoming aware that the British Fleet was at sea in his vicinity, retired behind his minefields at full speed. Moreover, this was the last appearance of the High Seas Fleet at any distance from its base until its surrender on November 21, 1918.

Naval warfare must be judged by results and not by particular incidents. Surely, therefore, it is at least as logical to attribute the final surrender to the cumulative effect of these three incidents as it is to regard them as exemplifying the triumph of the torpedo over the gun.

Reduced to simple terms, the capital ship is but the heavy artillery of the Navy. Heavy artillery in land warfare, when moving in enemy country, is always provided with suitable escort. So, capital ships require destroyer screens when steaming in submarine infested waters. If, during a land battle, the attacking infantry penetrate the line to such an extent as to menace the heavy artillery, the heavy artillery has to be withdrawn more to the rear. So, certain steps have to be taken to safeguard capital ships if a concentrated torpedo attack is made on them and there are no light forces in a position to counter-attack. Heavy artillery in land warfare, by means of crushing fire, enables the light forces to advance and seize their objectives, and then itself advancing it enables the objective to be held. Capital ships, by delivering heavy blows—or even threatening them—make it possible for the lighter craft to control communications, and the country to be fed.

To those who question the value of the capital ship it is suggested that they should endeavour to visualize a situation in which we had none and were opposed by a navy possessing them. It

would be analogous to exposing our jugular vein to a razor whilst attempting to defend ourselves with the shaving brush.

I am, Sir, yours faithfully.

NAVAL STAFF OFFICER.

On December 6 "The Times" for the first time used the heading "Great Ships or —?" pointing out that the Admiralty were apparently contemplating a naval construction policy involving the laying down of capital ships, and asking that a special committee should be appointed to consider the question, as was done in 1905 before a decision was come to on the question of building "Dreadnoughts."

CAPITAL SHIPS.

From Admiral A. W. Waymouth
(December 6).

Sir,—With reference to the controversy in *The Times* as to the value of capital ships, I have no hesitation in saying that it would be nothing short of madness for this country to give up capital ships. As long as other nations build this class of vessel we shall require sufficient to meet them. With our dependencies scattered all over the globe we require powerful vessels capable of keeping the open sea for considerable periods, and I am inclined to think that some of the advocates for abolition of this important class of vessel have thought only of the recent war, when operations were confined to the narrow limits of the North Sea.

That the design of capital ships can be much improved there is no shadow of doubt. Their principal defect is that when in action they expose the whole of their vitals to torpedo and gun fire. In my opinion all capital ships should be built for "end on" fire only, and when in action should always manoeuvre in line abreast. They should be double-ended, with screws and rudders at each end, with equal speed ahead or astern. In this manner a 4in. steel deck and 4in. inclined armour at the ends would give all the protection required, and at the same time the menace from torpedo attack would be reduced to a minimum.

Yours truly,

A. W. WAYMOUTH.

OUR OBSOLESCENT NAVY.

From Rear-Admiral S. S. Hall
(December 7).

Sir,—The flame of interest in our future naval policy has been fanned by your articles and correspondence of last week from the embers of dissatisfaction with naval affairs which has existed for the last five years. Without any dis-

tion we have all of us felt that something was wrong somewhere. For three of these years we were at war, when no radical change of policy, or even expression of such, was possible or expected, but now that we have struggled across the stream we have reason to ask if we are to continue with the same horses that so nearly left us in the river.

The causes of the dissatisfaction are these :—

We had a grand fleet with a preponderance of force of nearly two to one over Germany alone, and an auxiliary Navy of about 5,000 vessels. We had the assistance of the American, French, Italian, and Japanese Navies. We held the most favourable geographical position for a naval war that the atlas can furnish. And yet our main naval purpose, the protection of our trade, could not be carried out. These are the plain, sad facts of our naval experience in the last war.

The result was not due to any naval shortcomings in leadership, *personnel*, or material, and therefore discussion as to the conduct of the Jutland battle or the relative values of the ships or weapons employed leaves us cold. The result was entirely due to a new form of attack upon commerce which was not subject to control by the forms of naval power at our disposal. Briefly, submarines were the sole cause of the troubles; but for these vessels no doubts would have arisen.

The reasons that the dissatisfaction continues are because we know that we cannot reasonably expect to have so many Allies again, our geographical position can never be so favourable, and we are in doubt as to what effect the increasing efficiency of aircraft will have. There is also the certain knowledge with some of us that the submarine campaign was not the worst we had to fear in the last war, let alone the next one. In other words, the prospects for an enemy desiring our ruin through the destruction of our mercantile marine are more promising in the future than they have ever been in the past, and what the country wants to know it this :—

In view of the failure of the Navy, under most favourable conditions, with many Allies, to protect our trade in the last war, has it any hope of doing so, on its existing basis, under less favourable conditions? Can it even protect the lines of communications of our battle fleet if the latter is required to fight out of home waters? Was the submarine campaign of the last war reasonably efficiently conducted? Will the advent of aircraft make the position easier?

The situation in the war was just met, but only just met, by what may be called a policy of "more." More armour, more speed, more ships of all kinds (until they ran into many thousands)—more, in fact, of everything. A continuation of such policy will not help us; it will merely lead us to bankruptcy. The only pronouncement on naval policy issued under the aegis of the War Staff has been that their Lordships "profoundly dissent" from the suggestion

that submersible battleships should replace those on the surface. Taken by itself this means nothing, for to anyone with knowledge of the subject the idea of a submersible battleship is merely farcical. It does not demand "profound dissent." By implication, however, it inferred that our naval power must still be based upon a battle fleet, and in these days we know too well that means there will be no money left for anything else.

The late Lord Fisher had an uncanny habit of being always right in big things, and the writer holds that he was so in this, and the only remedy is in his words, "Scrap the lot," and transfer the Navy to the air. But a discussion of this is beyond the scope of this letter.

Yours truly,

S. S. HALL.

OUR FUTURE NAVAL POLICY.

Leading Article, "The Times"
(December 7).

The most important subject now before the country is the question of the naval construction policy of the Admiralty. An invincible Navy is the very life of the nation. Yet within a very few years the British fleet, so far as capital ships are concerned, will be third instead of first among the navies of the world. When all allowance has been made for the fact that the two nations to whom we shall, in this respect, yield pride of place are our friends, and in all human probability will remain our friends, this is a serious position. What steps are the Government and the Admiralty taking to meet it? Their first consideration must be security, and their second, as far as proper care for the national safety will allow, economy. After a prolonged period of delay and uncertainty the Admiralty have, there is good reason to believe, decided to recommend a programme of which the main feature is to be the building, at an early date, of a considerable number of capital ships. From the point of view of economy that course has, obviously, nothing to recommend it. The cost will be colossal. But that cannot be helped if it is the only way of establishing security. "We cannot afford," said Mr. WALTER LONG a few weeks ago, "as trustees of the peace of the world, to allow our supremacy to be challenged. If we ask our countrymen to make sacrifices, I am sure they will accept them, even in times like this." Of that there can be no question; but there is a question whether the construction of capital ships is really the best and surest

means of meeting the emergency. On that point, as has been clearly shown by the correspondence which has lately appeared in our columns, opinions vary widely.

The letter which we publish to-day from ADMIRAL S. S. HALL states frankly and forcibly some of the misgivings of those who believe that security is no longer to be found in a bulwark of capital ships. Conditions, he points out, have radically changed, and will change still more. During the war, in spite of the help given us by the fleets of our American, French, Italian, and Japanese Allies, and the great numerical superiority of our capital and other ships over those of the enemy, we were not able properly to protect our trade, because it was exposed to a new form of attack not subject to control by the forms of naval force at our disposal. In any future war the advantages on our side may be immeasurably smaller, and the power of the submarine must certainly be much greater. His own view is that, for these and other reasons, the capital ship is doomed, and that the only sane policy is "scrap the lot" and transfer the Navy to the air. We need not discuss the wisdom or practicability of this last recommendation. The point is that not a few competent judges agree with ADMIRAL HALL that capital ships have seen their day as the chief means of defence, and that it appears that the Admiralty have determined, without sufficient consideration of their views, to pay no attention to them. The matter is far too vital to the very existence of the country to be settled off-hand. It calls for the most careful and searching examination. The Admiralty should be guided by the precedent of the Committee which was constituted in 1905, before the Dreadnought was laid down, to decide upon the features of the future designs of different types of fighting ships. They should, as they did then, summon to their assistance not only practical sailors of all classes, but prominent shipbuilders and men of science. For ourselves, we express no opinion either against or in favour of capital ships. That is a question for the keenest minds in all branches of naval and cognate science to decide. But the opposition to capital ships is so considerable and so weighty that the country has the right to demand the thorough and speedy investigation of the whole question by a body of men who are not so likely as the Lords of the Admiralty sitting alone to be swayed by the traditions of the past. There is no need for the

Government to be hustled into precipitate action which may prove to be fatally mistaken. But there is every reason why they should, without delay, take steps, in the way that we have suggested, to probe the question far more deeply than, to judge from all the available evidence, they have so far thought of doing. For the life of the country is at stake.

ADMIRALTY POINT OF VIEW.

From Lord Sydenham (December 8).

Sir,—As the writer, in October, 1913, of the series of articles on "Warship Design" to which you referred on Thursday last, will you permit me to make a contribution to the question of the retention of the capital ship? The letters of "R.N." and "Naval Staff Officer" have most effectively disposed of the fallacies of "Flag Officer," based on a misreading of selected episodes of the Great War. One outstanding naval lesson of that gigantic contest is that, if the German battle fleet could have been brought to action and destroyed, the whole situation would have been simplified, and the dangerous U-boat attack on our mercantile marine would have been quickly brought under control. What this would have implied I need not point out.

In June, 1914, Admiral Sir Percy Scott suddenly proposed the abolition of the battleship, and you allowed me to reply to his article. His main contentions are probably now forgotten, and it is desirable to recall them. He asserted, among other things, that:—

The introduction of the vessels that swim under water has, in my opinion, entirely done away with the utility of the ships that swim on the top of the water.

The submarine causes to disappear three out of five of the functions, defensive and offensive, of a vessel of war, as no man-of-war will dare to come even within sight of a coast that is adequately protected by submarines.

With a flotilla of submarines . . . I would undertake to get . . . into any harbour, and sink or materially damage all the ships in that harbour.

If, by submarines, we close the egress of the North Sea and Mediterranean, it is difficult to see how our commerce can be much interfered with.

He proposed to retain, as surface vessels, only "a few fast cruisers, provided we can find a place to keep them in safety during war-time." Finally, he was convinced that it needed only the sinking of one or two merchant ships by submarines to bring all our overseas transport to an end.

These are perfectly definite propositions, which within a few months were brought to the test of naval war on a vast scale. How far does war experience—the only experience worth regarding—support them? I cannot here discuss this vital matter. In one respect Sir Percy Scott was right, and I was hopelessly wrong. He believed that the Germans would sink merchant shipping

at sight. I foolishly contended that the moral sense of the 20th century would not tolerate acts of "black piracy."

Prophecy is dangerous, and no wise man would set arbitrary limits to future developments of naval force; but there are two considerations which I venture to suggest. In the first place, the commerce of the world must continue to be carried in surface ships. Unless the League of Nations, or some valid combination of Great Powers, succeeds in banning submarine attacks on merchant ships, the latter must be armed in war. Is it conceivable that, while they will be called upon to fight after the manner of our forefathers, the Royal Navy, their "sure shield," will be forced to fight under water? Secondly, Sir Percy Scott allows us—I do not know why—"a few fast cruisers." Assume that all naval Powers accept and act upon his theories. Then each will certainly begin to build more powerful cruisers than its rivals, and the process must go on until the battleship, as the most powerful surface unit, returns.

For reasons too long to discuss, the submarine played a most important part in the late war, and may be said to have been nearly decisive so far as this country, absolutely dependant on overseas transport, is concerned. Other wars may be fought in very different conditions, and methods of attacking the submarine are by no means exhausted. It is possible that the development of the submarine may be arrested by the time required for submergence, and it is at least certain that the air attack will be far more dangerous in future than it proved in the war. The problems which the Admiralty now has to solve are vital to the future security of the Empire. While every lesson of the past must be taken to heart, it must not be forgotten that the conditions in which we fought may not exactly repeat themselves.

I am, Sir, yours obediently,
 SYDENHAM.

REPLY TO LORD SYDENHAM.

From Admiral Sir Percy Scott
 (December 9).

Sir,—Lord Sydenham's letter in *The Times* to-day calls for a reply. I have read the letter, and it amused me as much as it would amuse you to read a letter from me on cavalry tactics. Lord Sydenham always bumps up against me when I express an opinion in connexion with H.M. Navy, in which I served for 50 years.

Lord Sydenham is not a sailor; before the war he talked a good deal about submarines, although he did not know much about them. He expressed some opinions in reference to them which we naval officers thought very comic. His lordship said that on the high seas the chances of submarines would be very few, as they would require for their exist-

ence a parent ship. I wonder what Lord Sydenham was thinking about when he wrote this; however, it is very comic.

Then Lord Sydenham said that on the surface the submarine was a most inferior destroyer—slow, supremely vulnerable, and unsuitable for long navigation. I wonder what this meant. The submarine did not do her work on the surface, but under it, as her name implies, and during the war we did not find her supremely vulnerable.

In 1913 there was a fierce controversy as to whether we should build four battleships or two, and whether they should be large or small. I was of opinion then that we had sufficient battleships, and that it would be better to employ the money voted to build the battleships in building submarines and aircraft, weapons which I considered of supreme importance to the Navy, and we were sadly deficient in them. As I knew that the potentiality of these weapons had not been realized by the Admiralty in 1914 I wrote to *The Times*; the gist of this letter was:—

- (1) That these weapons had entirely revolutionized naval warfare.
- (2) That if we were at war with a country within striking distance of submarines, battleships on the high seas would be in great danger.
- (3) That if we went to war we should probably lock our ships up in a safe harbour, and that the enemy would do the same.
- (4) That no fleet could be hidden from the airman's eye.
- (5) That submarines could deliver a deadly attack in broad daylight.
- (6) That battleships could not bombard an enemy's port if it was protected by submarines.
- (7) That the enemy's submarines would come to our coasts and destroy everything they could.
- (8) That the submarine had driven the battleship from the ocean.

Lord Sydenham regarded my opinions as a fantastic dream, and thought that I had not grasped the logical results of my theories; unfortunately, those in power agreed with his lordship, and so we went to war in a totally unprepared state as regards the new weapons of naval warfare.

We are on the eve of declaring a new naval programme. Let us not forget that the submarine and aeroplane have revolutionized naval warfare; that battleships on the ocean are in great danger; that when not on the ocean they must be in a hermetically sealed harbour; that you cannot hide a fleet from the eye of the aeroplane; that enemies' submarines will come to our coasts and destroy everything. Lord Sydenham, before the war, said that no one would be so inhuman as to do this; I am afraid that his lordship knew as little about German *Kultur* as he did about submarines.

During the war the submarine dominated everything and very nearly lost us the war. It was only the Germans' want of forethought that saved us; with 50 more submarines—how little it would have cost them!—they would

have now been rulers of the world, and we should have been a German colony. It makes one shudder to think that the destiny of a great nation can be decided by one little, very little, mistake. We want forethought now, and must not too lightly scrap Jackie Fisher's idea that air-fighting dominates future war. Lord Sydenham thinks Lord Fisher's views may have been entirely mistaken, but he admits that Lord Fisher's visions of the future were almost uncanny in their accuracy. Let us look to the future, and prepare for a great development in the submarine, the mine, and the aeroplane; and we must not forget that the submarine did drive the battleship from the ocean or to the bottom of it.

Our battleships and the German battleships were locked up for most of the war. The German Admiral von Scheer only saw the smoke of Jellicoe's Fleet once; that was enough for him, he ran away as quickly as he could, without doing any appreciable harm to Lord Jellicoe's ships. I am told that the torpedo did not do much during the war. That is rather unfair on the gallant gentlemen who commanded our submarines; they were given dud torpedoes to fire, and the Germans must have had some dud commanders in their submarines or they would have gone into Scapa and sunk our Fleet in 1914. We must not only think of what the torpedo did, but of what in more skilful German hands it ought to have done.

We must not forget that tiny little mistake the Germans made in their building programme of 1911-12, for this mistake gave freedom to civilization, and if some one comes along with ideas a little off the beaten track Lord Sydenham must not regard them as a fantastic dream, nor think that the some one has not grasped the logical result of his theory, or that the some one is suffering from midsummer madness.

PERCY SCOTT.

STEAM AND SUBMARINES.

From Admiral Sir Herbert King Hall
(December 9).

Sir,—The English are a conservative race, and the British Navy is a conservative service. The Navy obtained its first steamship in 1823; for the next generation we still built magnificent 90-gun line of battleships and large frigates whose sole means of movement was their sail power, and which under most circumstances were at the mercy of the steamer. Nor was it until the '80's of last century that we thought it safe to build men-of-war without sail power. Further, it was not until the beginning of this 20th century that the last sea-going man-of-war with sail power was put out of commission, and that canvas finally disappeared

from the Navy, nearly a century after the first appearance of steam. From this we may estimate the time it is likely to take before the submarine—developed out of all recognition—comes into its own.

Yours, HERBERT KING HALL.

NAVAL CONSTRUCTION POLICY.

From Admiral Sir Cyprian Bridge
(December 9).

Sir,—The opening sentence of your first leading article in *The Times* of to-day tells the nation in plain English what it has to consider seriously. That sentence is:—"The most important subject now before the country is the question of the naval construction policy of the Admiralty." The next sentence is impressive:—"An invincible Navy is the very life of the nation." The public will naturally wish to know if the policy mentioned in your first sentence has been so thoroughly studied that it will be fairly certain to give us what is indicated in the second. The discussion of the future of "capital ships" is but a part of the matter.

One thing may be taken as proved, viz., that the present composition of our seagoing force is not believed by anyone to be satisfactory. Every one admits—some demand—that there should be great changes. The future may be dark and the best road to it uncertain, but there is one consoling fact. The almost magical ability of our naval architects, machinery designers, and gun-makers can give us anything that we ask for. We have only to ask for the right thing and we shall get it. Any disappointment with the floating material with which we went into the late war that has been felt cannot justly be traced to them. If there were no disappointment we should not now, invoking experience of actual and recent hostilities, be demanding important changes.

Perhaps it may be permitted to one who endeavours to explore the ambiguities of the present situation to state his conviction that, whatever naval construction policy we decide to adopt, it must embody the strategical and tactical principles or doctrine of those who direct it. This is inevitable, for it is a law of nature. It is respectfully submitted that it is not intolerably presumptuous to inquire, before we either give or withhold our approval of a considerable building programme, what is the doctrine that will govern it. There is a huge body of experience to prove beyond any possibility of refutation that immense sums of money have been spent in giving material embodiment to one kind of doctrine or another which proved to have no reasonable basis. Whole classes of men-of-war were soon rendered obsolete, not by the fault of their constructors but by the erroneous doctrine embodied in them. This opened an easy way by which the scrap-heap was quickly

reached. The taxpayers had the pleasure of paying and of learning that their money had been thrown away because there was neither strategical nor tactical justification for the ships on which it had been spent. Whatever answer may be given to the question to which you assign a prominent place at the head of a column, viz., "Great ships or — ?" it will be desirable to know whether the units of our future fleet—be their antagonists of what class they may, or operating in, on, or under any element you please—are intended to rely, for their defence, on passive "protection" or on offensive power.

Your obedient servant,

CYPRIAN A. G. BRIDGE.

CAPITAL SHIPS AND SUBMARINES.

From Mr. John Leyland
(December 9).

Sir,—The problem which now lies before the Admiralty is undoubtedly more difficult than any the Board have ever been called upon to solve. It is infinitely more complicated than that which arose when Lord Fisher proposed to build the Dreadnought, for that ship, after all, was but the logical development of the then existing type of capital ship. Now we are told that the present fleet is obsolete or rapidly becoming obsolescent, and—though not by you, Sir—that the right policy, which seems like a negation of policy, is to "scrap the lot." That every existing ship will be "scrapped" in course of time is, of course, true, but there is nothing new in that. Like all instruments of war, and most instruments of peace, scientific progress and invention will deprive them of value. Meanwhile, as Admiral Sims says, the Navy is a "going concern." It is a living organism, whose business in peace is to train officers and men, as in all former times, in the largest sense. The Navy is a highly specialized profession, demanding the widest experience and the highest attainments in its officers and the greatest efficiency in its men. That is why ships and fleets are and must be kept in commission. *Navigare necesse est*. This truth should give pause to uninstructed persons who may put a literal construction upon the phrase "Scrap the lot!" I venture to quote the following from Lord Jellicoe's "Crisis of the Naval War":—

Only those officers and men who served afloat in the years immediately preceding the opening of hostilities know how great the struggle was to gain that high pitch of efficiency which the Navy had reached at the outbreak of war, and it was the devotion to duty of our magnificent pre-war personnel that went far to ensure our victory. It is essential that the Navy of the future should not be given a yet harder task than fell to the Navy of the past as a result of a policy of starving the personnel.

These considerations are quite germane to the

present discussion, because the Navy since the war has probably been more starved than any other Department of State. It is becoming for all of us to speak with diffidence concerning future naval policy, but it may be urged that the existence of submarines is in itself no reason against the building of capital ships. Such was the experience gained during the war, and such the advances made, that after the sinking of the three armoured cruisers and the Formidable, battleships, with attendant destroyers and sometimes using explosive paravanes, navigated in security. No capital ship of the Grand Fleet was sunk by submarine.

There must be no confusion between the U-boat attack upon warships and that upon the mercantile marine and the transports. The latter was an entirely new, and in practice unexpected, form of sea warfare. Lord Jellicoe and Admiral Sims—the latter in his "Victory at Sea"—have shown how complete was the collapse of the attack upon commerce. The pursuer became the pursued. Discovered by electrical detectors, directional hydrophones, aerial observations and flares, and hunted by destroyers, patrolling vessels, submarines, Q-boats, and motor launches and chasers, and attacked by depth charges, bombs discharged from guns and dropped by surface and flying craft, and by other multiplied means, the U-boat finally failed. The war ended, mainly owing to this failure, before the agencies for destroying submarines had fully developed.

Therefore the capital ship will not be condemned merely because of the existence of submarine boats. There remains the question of attack from the air. In investigating this matter the United States Navy has an advantage over our own. Its flying service has not been divorced from it. American flying craft are agencies of the fleet. They work in close co-operation and have operated and experimented together. Yet capital ships are being built for the United States Navy of the most formidable character, without any apprehension of destruction from the air. In this country, where aircraft are under separate control, co-ordinated work may not be so easy or so effective. Nevertheless, it is incredible that the Admiralty will propose the building of capital ships if serious danger from the air is to be apprehended.

Whatever may be the decision, it must surely rest with the responsible naval authorities, who, we may assume, will welcome the counsel of the most eminent shipbuilders and scientists on the best means of giving effect to their plans, just as was done in Lord Fisher's time. It is surely impossible to visualize a situation in which the Mistress of the Seas will find herself richly dowered with the *poussière navale* and yet engaged with Powers which have provided themselves with the most powerful fighting ships of the sea. *Fas est ab hoste doceri*. Admiral Scheer and all the Germans have declared that

the U-boat warfare would have been impossible without the support of the big fleet.

I am, Sir, yours faithfully,
JOHN LEYLAND.

On December 9 the Cabinet announced that an investigation of the whole question would be instituted by the Committee of Imperial Defence, and that pending their decision no new construction would be undertaken.

A "HERETIC" ON THE NAVY.—I.

By Rear-Admiral S. S. Hall .
(December 10).

Lord Jellicoe has told us, that by reason of the submarine campaign in the last war we were "closer to ruin than we have been for 200 years." But even he has not told us how close we were.

Confidence in the capital ship, however, was badly shaken; how could it be otherwise when our Grand Fleet, supported by all the Fleets of our Allies, was impotent to help us whilst we hovered on the brink of disaster? Who can wonder if the public are bewildered at the thought of rebuilding such an armada when the cost of each unit has risen to at least eight millions? Indeed it is very much more, for they require a host of craft to assist and protect them.

They want to know more exactly what these leviathans are to be built for. To be told that they will win a naval battle, if they get one, is not sufficient, for we have just spent four years waiting for such a battle, and in the end won the war without it. It is time to make an examination of our naval experience in the last war, with particular reference to the future of the capital ship, and to show that in the full light of that experience a complete change is demanded in the composition of our Fleet.

I am sensible of being about to tread on holy ground, for the sanctity of the quarter deck is ingrained in all who have spent their life on it.

I feel that some scratches will be made on the paintwork, and in order to stem as much as possible the flood of invective that is usually poured on such offenders, I shall endeavour to forestall as much criticism as possible in the course of my arguments. I propose to refrain from the customary shibboleths on naval strategy and tactics, for they are well known and so rather wearisome: it will be enough to deal with the problem as it is to-day, without consulting Napoleon or even Nelson; besides I am sufficiently a heretic to believe that much of the mist which shrouds clear naval thinking

to-day is due to an undue straining of old maxims to meet new conditions.

PURPOSE OF THE FLEET.

The main purpose of our Fleet was clearly defined in an Admiralty memorandum of 1910:—

The really serious danger that this country has to guard against in war is not invasion, but interruption of trade and destruction of our mercantile marine. . .

The strength of our Fleet is determined by what is necessary to protect our trade. . . .

So ran this memorandum to the War Office on the subject of invasion. It proceeded to point out the extreme difficulty of invasion at that time and concluded with the decision "that an invasion even on the moderate scale of 70,000 men is practically impossible." To carry out this main naval purpose, the strength of our Fleet before the war was based upon what was known as the two-power standard, which meant that we were to be able to compete successfully with any two foreign navies. Then came the war, and we were fortunate enough to find ourselves not with a two-power standard but with France and Russia immediately on our side, quickly followed by Japan and Italy and lastly by America. And yet we nearly suffered defeat from the attack on our trade.

All this is common knowledge, but the tale is not half-told. We had in addition the most favourable geographical position it is possible to find: to use a familiar simile we "sat across Germany's front door." It is unnecessary to go into details, but it was a very important factor and should never be forgotten in judging the experience of the war. It is equally important to note that it cannot occur again. There is one other factor which is not well known. In discussing the policy needed to meet another attack on our trade, it is of the utmost importance to gauge accurately the nature of the last one. Was it a very serious one? Was it even moderately good? Do we know the worst about it? and so on.

To answer these questions a few very simple technicalities are necessary. Towards the end of 1914 Germany realized that the submarine was her ideal weapon; she did not feel equal to challenging us for supremacy on the surface, and decided quite rightly for a limited war at sea with a submarine fleet. The incentive to turn these vessels against merchant ships was bound to come, and when it did she seized upon it, decided to ignore our surface Fleet altogether, and plank everything on a submarine war on commerce.

SUBMARINE AND MAN-OF-WAR.

It should be noted in passing that when we read that the Grand Fleet mastered the submarine menace, and the submarine did not materially affect the value of the capital ship, &c., these statements are not founded upon fact. With the provision of about 100 destroyers

and a great many other craft, the capital ships were certainly safer, but it should be remembered that they were not often at sea, and their defences were never tested. The Grand Fleet was practically ignored altogether. In fact German submarines had very stringent orders not to attack men-of-war. On no occasion was the Grand Fleet subjected to a serious attack by submarines; the latter's sole objective was our mercantile marine.

With the decision to conduct a submarine war on commerce Germany had a clear cut choice of weapons with which to arm her submarines—the gun or the torpedo. These two require an entirely distinct class of vessel for their proper management, and it is most important to distinguish clearly between them. The submarine torpedo vessel must be comparatively small because under-water speed, handiness, and quick diving are the essential features. This is the class of submarine for attacking warships. The submarine gunship or cruiser as she has come to be called is a much larger vessel. She may be required to carry prize crews, under-water qualities are only those necessary for evasion and not for attack, a torpedo armament, or at any rate a large one, is not required, and so space and weight are available for a good gun armament and protection; the loss of under-water speed due to the resistance of the guns and other obstructions to a stream-lined hull does not matter.

Germany, as we know, decided upon torpedo vessels, and built them in large numbers. Her reasons were, without doubt, that she already had the nucleus of such a fleet. She knew how to manage them and she hoped to improvise cruiser qualities by equipping them with one or two small guns. There was the further advantage that such vessels could be laid down at once to a proved design and so got on service more quickly.

The decision to torpedo merchant ships had two very far-reaching results. It enabled us to employ almost any ship as an anti-submarine vessel; trawlers, drifters, yachts, launches, even sailing ships were all pressed into this service, so that we soon had thousands of these vessels out, which made the enemy's task more difficult, and the establishment of convoys further increased their troubles. The second result, which they also discounted, was the offence which was bound to be caused to neutrals; this, as we know, culminated in the entry of America into the war and in Germany's defeat on shore.

SUBMARINE CRUISERS.

It is my firm belief, and that of many others, that had Germany employed her submarine torpedo vessels against our surface war fleet and equipped a proper submarine cruiser fleet for a war on commerce she would have won the war. Our enormous auxiliary patrols, consisting of weakly-armed vessels spread out without sup-

port, would have been rapidly wiped out in detail, and it would have been impossible to find protection for our convoys, which would have had to be universal and open to attack all over the world. A submarine cruiser of about 3,000 tons can be given a sea endurance of 50,000 miles and six months.

Germany did not ignore the submarine cruiser entirely. Directly the torpedo business began to flag she began to build submarine cruisers, and large numbers were under construction when the armistice was signed. One or two were even at sea in 1918, and, indifferent vessels as they were, lacking boldness in design, of poor stability, and unpopular with their officers, there was one occasion when a convoy, including the escorting cruiser, was badly mauled by one of them. Every one knows of the trouble caused us by the Emden on the outbreak of war. The difficulty in our next war will probably be to compete with a squadron of submersible Emdens already at sea. One cruiser or even two with each convoy will not be enough, for submarine cruisers will probably work in squadrons, and since a protected convoy is open to any form of attack, the convoy must expect to be shadowed until dark and then sunk out of hand.

The problem confronting a decision on our naval policy may now be clearly restated. It is the protection of our sea communications in the face of submarine cruisers, probably working in squadrons consisting of vessels with a sea endurance of 50,000 miles and six months' cruising capacity. The attacks may take place anywhere. We cannot expect to have as favourable a position as in the last war, nor may we count on the assistance of many Allies.

REPLY TO SIR PERCY SCOTT.

From Lord Sydenham (December 10).

Sir,—I am sorry that Sir Percy Scott has not replied to my letter, and contents himself with denying my competence to express an opinion on naval questions. I freely acknowledge his superior authority, and I have humbly admitted my own mistake and his perfectly correct forecast in regard to the attack on the merchant marine which was the main achievement of the submarine in the Great War. My acquaintance with the submarine is, however, probably at least as old as that of Sir Percy Scott. More than 35 years ago I went to Sweden to see trials of one of the earliest types of this new naval weapon, and I was the first to suggest the periscope which has made it a practical success, although, of course, the idea would have quickly presented itself to many other minds. I have quoted the *ipsissima verba* of Sir Percy Scott in June, 1914, and anyone can compare them with the actual happenings subsequently. His main

contention seems to be that the surface ship can no longer be trusted to go to sea, and must remain locked up in fortified harbours, where nevertheless he was prepared to attack it. Yet, so far as I know, the Grand Fleet made wide incursions into the North Sea whenever they appeared desirable, and never lost a battleship. Could the submarine menace have restrained the movements of the ships under Admiral von Spee, which, if they had not been destroyed by Sir Doveton Sturdee, using surface vessels, might have been employed with disastrous effects?

I frequently ventured to disagree with the views of the late Lord Fisher, but I always found him ready to reason with me on the equal terms which Sir Percy Scott somewhat contemptuously denies. The great question to which you, Sir, are wisely giving prominence turns upon the potency of the offensive against the submarine in the future. Defensive measures are of minor account. Now, as in October, 1913, I believe that the vital problems which we have to solve should be referred to "a strong committee of well-chosen naval officers, with a statesman of experience as chairman, for investigation on the basis of reason and known facts."

I am, Sir, yours obediently,

SYDENHAM.

NAVAL CONSTRUCTION POLICY.

Leading Article, "The Times"
(December 10).

Last night Mr. CHAMBERLAIN, in very few words, made the promised announcement of the course which the Government propose to adopt on the question of naval construction. It contains two points of prime importance. The first is that the whole question of naval strength, as affected by the latest development of naval warfare, is to be made the subject of an immediate and exhaustive investigation by the Committee of Imperial Defence; the second, that until the results of this inquiry have been considered and the lessons of the war definitely ascertained, "more particularly as regards the place and usefulness of the capital ship in future naval operations," the Cabinet will present no programme of capital ship construction to Parliament. Except in one particular this declaration of policy agrees exactly with the course on which we have insisted as the only possible way of dealing with the grave necessities of the present situation. If, as was believed, the Admiralty had framed a definite programme of naval construction, "more particularly" with regard to capital ships, it has been decided on second thoughts that it is the better part of wisdom not to lay it before the House and the country. It is agreed that the whole question is to receive the

searching examination for which we have contended, and it is to receive it "at once." But by whom is the inquiry to be conducted? On that depends the whole of its value. Unless it is put into the hands of the right men, and unless it really is to be made thoroughly searching, it may bring the country and the Empire untold harm. The Government propose that it shall be "intituted" by the Committee of Imperial Defence. If that means that this eminent body is itself to undertake the work of investigation the proposal invites the strongest criticism. A mere glance at the composition of the Committee is enough to show that hardly any of its members have the special knowledge which it demands. The FIRST LORD of the ADMIRALTY, the FIRST SEA LORD, and the DIRECTOR of NAVAL INTELLIGENCE are its only naval authorities, and of the rest, to name only two of them, it is obvious that the PRIME MINISTER, who is the Chairman, and the CHANCELLOR of the EXCHEQUER have too much other work on their hands to be able to devote their energies to the proper consideration of the subject. We cannot, therefore, believe that the Committee of Imperial Defence is itself to constitute the examining body. We cannot too strongly insist that the men who are to investigate the problem, on the solution of which the whole future of the country and the Empire may depend, must be an expert Committee appointed *ad hoc*. The matter is far too serious to be handled by amateurs, however eminent. The brains and expert knowledge of the foremost sailors, the foremost scientists, and the foremost shipbuilders that the nation has at its disposal are indispensable to the inquiry.

A "HERETIC" ON THE NAVY.—II. By Rear-Admiral S.S. Hall (December 11).

In my first article I discussed the salient points of our commerce protection difficulties. The conclusion come to does not admit of argument; in addition to its hereditary foes, our trade is now, and in the future, open to far more serious attack than it has ever been in the past; further, the attack can be made by any nation desiring our downfall without the obligation on their part to provide any capital ships.

Repeating that our main naval purpose is to protect our trade, let us now examine the fitness of our present fleet to fulfil its object. It is often said that the foundation of our naval strategy is blockade. During the last war it was so. A distant blockade was possible, due to our unique position, and so far as Germany's surface fleet was concerned it was effective. To this extent our battle fleet was good value, with the German fleet opposing us, where it was, and in the then existing state

of torpedo craft of all kinds we were not justified in taking the risk of what an unopposed fleet might do. Our Grand Fleet certainly relieved us of all anxiety upon this head, though as a means to the protection of our trade the blockade was, as we know, ineffective.

It would be interesting, though not vital to my final proposals, to know exactly what the German capital ships could have done if we had not had more capital ships to oppose them. We all remember some most unpleasant hours before the first impressions of Jutland were removed and many of us must have asked ourselves, what next? The first shock and the moral effect would have been great, but what after that? Even though we relied upon the Grand Fleet to deal with them, our flotillas of submarines would have been intact, the destroyers very nearly so, and there were some mines.

AFTER JUTLAND.

What could the German capital ships have done? Invasion was ruled out. They were not adapted for commerce raiding. They could not have seriously impeded cross-Channel traffic. In the face of submarines by day, mines and destroyers at night, they could not have stopped there 24 hours, for they must have proceeded at high speed, with many destroyers to protect them, and a destroyer's endurance on screening work is short. I repeat then, if we had been badly beaten at Jutland, what exactly could or would the victorious German capital ships have done?

The answer would be interesting, for it appears in the highest degree improbable that we shall be able to blockade even distantly an enemy's capital ships in the future for these reasons. Without naming any at present friendly nation as a prospective enemy, for it is objectionable, this much may be taken as certain. We have no prospective enemy to build against in home waters, and the lines of communication of our battle fleet, if it is to find an enemy abroad, must be thousands of miles long. How, if we could not protect our trade in the last war under good conditions, do we propose to maintain the battle fleet abroad? Can any tenable base be found for the fleet within 600 miles of any prospective enemy? What, then, are the prospects of any form of blockade for the future? It may be confidently answered that, so far as capital ships are concerned, there are none whatever. I assume that we are not going to commit the crowning folly of building a fleet of capital ships that is inferior to any other, and therefore that such a fleet would be expected to fight abroad if required, or at any rate to try to do so.

Is it supposed that our future enemy, whoever it may be, will be more obliging than our last, and that he will immediately come out

to meet us in inferior strength? Why should he? If he does not, I would ask any reader to select any enemy he chooses and, if he ever visited Scapa during the war, to tell us how he proposes to keep open the lines of communication of such an armada as he saw there, in the face of the opposition to be expected. I contend it would take another armada to do it, if it could be done at all.

FIRST CONCLUSIONS.

To go further, will an advocate of the capital ship tell us what he will do with these vessels after he gets them abroad, even if he is granted a battle and wins it, observing that the main accomplishment of the purpose of our Fleet, the protection of trade, has not even been commenced by anything he has done. The conclusion I reach is that in any naval war that can reasonably be forecast, capital ships can do nothing to assist in the protection of trade, either directly or indirectly. It is even worse, for, by retaining whole flotillas of light cruisers and destroyers, they actually retard any other measures that may be undertaken. They are also locking up large numbers of valuable officers and men, and in peace are liable to absorb the greatest part of the Navy Estimates.

The situation is not new, it has been before us for five years; for three of these it was met—but, as I pointed out before, only just met—by a lavish policy of adding to everything. But what have we done since? Are we to continue with "more"? Are we bankrupt in ideas? Is the battle fleet maintained purely as a diplomatic weapon? Or are we training the *personnel* to man a still more costly fleet which can do even less to protect our trade than before, for I have not as much as mentioned aircraft yet, a still further menace to capital ships and the bases which shelter them?

This article and the preceding one have been purely destructive criticism of naval policy since the war. I propose next to indicate what appears to be the only way open to us to protect our trade in the future with a reasonable hope of success and, let me add, at a reasonable cost. I propose also—this to stave off premature criticism—to answer all the objections to a navy over the sea and under it that I can think of.

LIMITATIONS OF SUBMARINES

From Admiral A. W. Waymouth
(December 11).

Sir,—Sir Percy Scott asks the very pertinent question "What is the use of battle-ships?" and he professes not to know. I do not give him credit for such professed ignorance, as he really has a brain, but will

merely answer the question by asking another. What does Sir Percy Scott think would have happened in the late war if we had possessed no battle fleet, or even an inferior battle fleet to the Germans, with nothing but submarines and aeroplanes ?

We have a bitter recollection of what even one fast cruiser can do on the trade routes in the exploits of the Emden. Had Germany been in the position to put powerful squadrons of surface ships on all our trade routes, as she would have done had it not been for the Grand Fleet, I fancy Sir Percy Scott and I would have now been in the position of working under a German sweating system, probably making toys to dump in America !

The submarine has its limitations, so also has the aeroplane, and until these limitations are overcome it is no use talking of abolishing surface craft. The submerged speed of the submarine is of necessity considerably slower than the surface craft, and as these vessels are increased in size they become increasingly difficult to submerge with rapidity ; owing also to inertia, the difficulty of trimming and control under water becomes greater and greater as the size increases, besides which they are more easily spotted by aeroplanes, particularly in clear water. Under water they are extremely vulnerable.

Yours truly,

A. W. WAYMOUTH.

CAPITAL SHIPS AND POLICY.

From Admiral W. H. Henderson
(December 11).

Sir,—The question of the capital ships is one of policy. A competition with the United States and Japan will be infinitely greater and more prolonged than was that with Germany. It will lead to the perversion of all the principles of disarmament we have since endeavoured to maintain. It is to be hoped that if we do not intervene the competition which has begun between these two Powers will die down.

Our intervention would signify the transference of the strategic seas from European waters to the Pacific Ocean, where we have no facilities for the maintenance of a large battle fleet ; the collateral cost of their provision would be enormous. Under modern conditions, I doubt if battle fleets can be maintained on enemy coasts with distances from their main sources of supply which the lengths and breadths of the Atlantic and Pacific Oceans imply ; temporary bases at these distances are valueless.

The principles hitherto governing the use of the now-called capital ship no longer apply ; they reached their maximum in the middle of the last century, when she had freedom of movement limited only by the weather, and a large

radius of action limited only by her three months' supply of fresh water ; when all her displacement except the weight of hull, stores, crew, &c., and the comparatively small proportion required for sail propulsion, was devoted to great offensive power in a large armament. Since then, owing to the introduction of steam and armour, and the gradual development of her antagonists, the torpedo, the submarine, the mine, the bomb, and the aerial torpedo—the powers of which will in the future be greatly increased—she has lost her mobility, her freedom of movement, her radius of action, and her comparatively great offensive power. She is now no longer supreme on the water ; if she goes to sea, her main object is to protect herself ; she cannot move without defensive auxiliaries of all kinds. Greater and greater proportions of her displacement are being taken up in self-protection and defensive devices, and though her speed, which is one of them, has been increased, her cost is prohibitive. Battle fleets of opposing Powers are necessarily confined to their bases, watching one another. The weaker fleet will never come out to seek destruction, and the naval work of a war will be carried out by smaller craft of all descriptions—we have had recent examples of this.

Depending on the age and environment, every human invention, whether simple or complex, or whether a weapon of war or otherwise, has its period of maximum efficiency. When that period is passed under changing conditions and the developments of science, it is superseded by other inventions and implements which may be either more effective for the purpose or, in the case of a weapon, may so impair its efficiency that it becomes useless for the purpose for which it was originally designed ; the purpose itself may no longer be required. Illustrations abound—the passing of the fortress is one.

Judged by these considerations, the day of the capital ship as now conceived is over, and the cost of a new fleet with the necessary docks and facilities for maintaining it is beyond our present financial resources. To many it will appear inconceivable that temporarily we may become the third naval Power, but the antidote to the capital ship will be so rapidly developed that the fact will be realized by others as well as ourselves, and it will not be wisdom to incur what will prove to be a useless expenditure.

W. H. HENDERSON.

WHAT IS THE USE OF BATTLESHIPS ?

From Admiral Sir Percy Scott
(December 13).

Sir,—Will you help me in my ignorance ? I cannot get an answer to my question, "What is the use of a battleship ?" She must be of some use, or the United States and Japan

would not be building battleships. A lot of naval officers have written to me, but they only tell me what she is not useful for; they will not answer my question. Is her use a secret that only a few know and will not disclose? Will it be disclosed by the Committee of Imperial Defence, who are going to settle what the weapons of the new Navy are to be?

Admiral Hall, a young and vigorous officer who had wide experience during the war, will not enlighten my ignorance; he is only telling the public what the battleship is not useful for. What is the good of that? Before we spend 109 millions on battleships and another 100 millions in making safe harbours for them, we ought to know what use they are. Now, Sir, do try and enlighten my ignorance. Ask Lord Sydenham or someone else who knows all about naval affairs.

Yours faithfully,

PERCY SCOTT.

P.S.—I had just finished this letter when I got a further show up of my ignorance. I got a letter from an airman, who wants to know why I am talking about "safe harbours for battleships!" He says such a thing is impossible: a door will not do; the harbour must have a roof on it. "Have I forgotten the attack made in 1919 by eight aeroplanes carrying torpedoes that flew from Gosport and torpedoed the fleet at anchor in Portland Harbour?" he asks.

This danger can, of course, be got over by roofing in our harbours; it will only cost a few thousand millions and will be provided for in the new Naval Estimates.

A "HERETIC" ON THE NAVY.—III.

By Rear-Admiral S.S. Hall (December 13).

We are so obsessed by the custom of many years that when statements are made such as that by the First Lord of the Admiralty a few weeks ago, "That as trustees of the peace of the world, we cannot allow our supremacy to be challenged," our thoughts at once fly to capital ships—evidently they were in his mind, for in the next breath he hinted at financial sacrifices.

It would, after our recent experience, have been more satisfying to the country if he had said, "That, as trustees of the peace of the world, we cannot allow our sea communications to be cut." We have had four years of naval supremacy, a far greater supremacy than we can hope for again. But it was nerve-racking and very expensive. In suggesting a new basis for naval force I therefore propose to take first the protection of these communications, and because, in the words of the Admiralty inemo quoted, "The strength of

our Fleet is determined by what is necessary to protect our trade."

Although the post-war capital ships we are threatened with are presumably only intended to fight similar vessels and only two nations at present possess them, it is not necessary to specify any particular enemy in a discussion of this sort, but it is assumed that our naval policy is mainly, if not entirely, one of defence. We have an Empire large enough to absorb our activities for many years, we desire to protect it, and above all to guard our sea communications. The main points in which any probable war will differ from the last are that the enemy will be much farther away, possibly with a large seaboard and many exits, and that submarine attack must be expected anywhere and not confined merely to the northern half of the Atlantic.

It may temper criticism somewhat to remind your readers again that as the existing naval policy failed to protect trade in the last war, and, if my arguments have any force, cannot hope to do so in the future, *no provision at all exists now* for the purpose. Any policy which affords even fair protection is something to the good. There may be plans for use on the outbreak of war, but these may be too late; in any case they can be put into force then whatever policy is adopted now.

SUBMARINE CRUISERS.

The most serious attack to guard against is that by submarine cruisers working in small squadrons. As will be shown later, it does not seem possible to guarantee complete immunity, but much may be done. The first thing to do is to get shipowners and shipbuilders to cooperate. All merchant ships must be fitted to carry at least two good guns not smaller than six-inch, and a good range-finder. It must be done with financial assistance, if necessary, when the vessels are building. Let the price of one capital ship go to this. The guns and mountings must be ready to ship instantly, as they have been for some years in certain of our liners. Measures for the immediate establishment of convoys must be ready wherever it is considered possible to keep a route open.

For the naval protection of the convoys, the best would be submarine cruisers and aeroplanes, but it is doubtful if this is possible for many convoys. The numbers required of the former, for every convoy would require at least two, are probably prohibitive; it is scarcely reasonable, though it would be ideal, to make every merchant ship carry aeroplanes, until they are able to rise vertically with a horizontal propeller. The submarines and aeroplanes must be stationed at all our oversea bases; the former must be of the smaller patrol class, and by hunting the enemy's submarine cruisers will greatly restrict their activity. We have definite experience of this in the last war. On a great many routes it is possible to maintain a fairly con-

stant aerial patrol to warn shipping, inform our own submarines, and to attack those of the enemy. Each base and route must be taken on its merits, and sufficient air and submarine force must be available from those not on patrol to be able to defend the base against any attack that it may be expected to have to repel. It should be noted in this connexion that the whole of the existing base defences, excepting mines, will then be superfluous, and considerable relief afforded financially. This applies to all bases, both at home and abroad. It is not a vision of the future, but a fact of to-day, that all our permanent defences can be replaced by submarines and aircraft.

Towards the end of the last war our production of aircraft was nearly 100 a day; in the next war the cry will be for more and still more of them. Wherever they can replace other weapons there is great gain, for if certain bases are quite obviously not open to attack, the air force can be rapidly transferred to where it is required. Permanent defences are usually a dead loss. Even Heligoland only fired one round in four years. What, one wonders, was the sum total of wasteful effort expended in the many places where we kept elaborate defences, fully manned, waiting for four years for an enemy who was never likely to come ?

MASTERY OF THE AIR.

All aeroplane provision in peace must be of good value because it is a mobile force and, what is more important, it entails having a nucleus of the army of pilots and observers that will immediately be wanted when war breaks out. Still the convoys cannot be sufficiently protected by these means. The next step is to prepare for a vigorous offensive on enemy submarine bases. Capital ships or surface ships cannot help us; we know it to our cost from the last war. Again, aircraft are the only means available.

In certain cases the offensive can be carried out with the declaration of war from a shore base, in others the distance will demand a striking force of aeroplane carriers. This is the nearest approach to a capital ship it will be necessary to provide. These vessels must, however, sacrifice all fighting qualities to that of speed, underwater protection and the transport of as many machines as possible. Though they cannot fight themselves, they should carry enough aircraft to put any one capital ship out of action and be able to keep out of her range. No one can say definitely how many this is, but there must be some number, not a large one, over and above which no surface ship could compete with. Would any capital ship feel confidence in repelling, say 40 torpedo-carrying planes? If so make it 50. For the price of one Hood we can provide some 6,000 machines and carrier as well.

Attack on our convoys by enemy surface warships depends for its severity upon how far

the enemy's bases are from the trade routes it is desired to protect. Capital ships and even light cruisers are ill-adapted for the work and will remain so as long as they depend upon steam power. In many cases it will be evident that they can do little; the normal endurance of these vessels is somewhere about 4,000 miles at 15 knots. But in other cases the attack may be serious; if the ships in convoy have all a good six-inch armament they could help considerably in the case of a light cruiser, but if capital ships such as battle-cruisers are within striking distance it may be necessary to have submarines and aircraft carriers with these convoys. As in the case of submarine cruisers these vessels should have their endurance restricted by being always open to submarine attack and so requiring destroyer protection and high speed. They must also be attacked off their bases when they leave and when they return to fuel by blockading submarines. A convoy open to attack by them should always be ready to scatter upon the development of any attack; or when darkness falls if it is evident they are being shadowed. It is open to question if convoy of any form is desirable on routes exposed to attack by battle-cruisers or capital ships of any kind. On certain routes minefields will assist us, but a complete answer cannot be given without minute investigation of the trade routes which are threatened.

Once more I repeat, some protection at any rate can be offered, but so long as we rely upon capital ships we know we have none at all. If any prospective enemy continues to equip capital ships, which I personally doubt if we stop doing so, they can only bring a divided effort to the fight for the mastery of the air which is the key to success in the next war.

In a concluding article I shall deal further with the powers for evil of an unopposed fleet of capital ships and with other objections to their discontinuance.

On December 14 the Imperial Defence Committee met for the first time to begin the investigation into the future needs of the Navy regarding capital ships. The Prime Minister had announced on the previous day in the House of Commons that the Committee would bring before them all the expert evidence they could.

A "HERETIC" ON THE NAVY.—IV.

By Rear-Admiral S. S. Hall
(December 14).

The uncertainty of the damage our trade might suffer from an unopposed fleet of capital ships is the main point that those in favour of capital ships will urge, and it is without doubt the most difficult one to meet.

It has already been asked, What if the

enemy has capital ships and we have none? The answer can only be given after the reply to another question. What exactly can the capital ships do? That they will by themselves empty their magazines on places defended by aircraft and submarines is not reasonable; if they are supported by destroyers and aircraft, it is necessary to know how far they have to come and how long they can remain. They are not built or in any way suitable for commerce destroyers, though they may be so used for short raids. If the means outlined for dealing with them are considered as unsatisfactory will my critics tell me how we propose to deal with them in any other way? Can, for example, a capital ship of any kind blockade an enemy capital ship from even 600 miles? If our base is nearer to the enemy than this how will it be protected from intensive bombing, and how will the lines of communication be protected? This can only be done by means of aircraft and submarines, so that they seem to be necessary anyhow. But what can the capital ship do to stop short raiding by the enemy's surface cruisers working possibly with a choice of many bases thousands of miles from us?

To return to the question, What can these unopposed capital ships do? Invasion of any country which can produce war material on even a small scale is impossible now; its inherent cumbersomeness makes it so. Sea tanks can certainly be made for short distances, but can they carry the artillery now used in land fighting?

If it is agreed that invasion has become even more than the "practically impossible" we were told it was in 1910, capital ships are not required to support it. Blockade by them is definitely dead. Unless the enemy is willing, and history offers few examples, they cannot defeat the enemy's capital ships; if they do or do not win a battle they can take no part in the protection of trade against the most serious menace. What then are they for? Is it not reasonable to ask those who advocate the provision of such vessels to tell us in some detail? Is it a satisfactory argument that Japan and America are building them and so we must, and is it not open to question whether our naval prestige is not sufficient to have been the cause? It has been often said, Lord Sydenham was the last to say so, that if we had decisively won at Jutland the submarine campaign would have been ended. This would certainly be some reason for building capital ships. What grounds are there for this statement? Is it contended that we could have carried the shore defences of Borkum, the Ems or the Jahde with our capital ships, or that the existence of the German High Seas Fleet was vital to finding enough *personnel* to man the submarines? Surely the latter is not a serious reason for building a battle fleet!

THE NEXT WAR.

I am well aware that this most disturbing question, the only serious objection to abolishing capital ships, can only be thoroughly answered by giving in detail a concrete situation. One critic has said that the real answer to the scrapping of capital ships is to imagine ourselves with nothing but submarines at the beginning of the last war. I have already said that in the then existing state of torpedo craft of all kinds the capital ships were good value, but what of the future? Even supposing we must now prepare for another war with Germany, is it conceivable that Germany will in the course of her preparation neglect to provide herself with a properly-designed submarine fleet, manned by officers who are fit and disciplined, and not sent to sea to get sober? What will all the capital ships in existence do against such a menace? My reply is, nothing. The only answer is in aircraft and submarines.

Another reason given for retention of capital ships is that German submarines never sank a modern one. The *Audacious* was sunk by one, but this is beside the point. The real reason is that they never tried; on some occasions enemy submarines on passage to the trade routes were reported to and possibly seen by our capital ships, but they were never seriously attacked by them—it was strictly contrary to their orders to attack men-of-war.

Captain Dewar tells us that much of the success of the submarine was due to a lack of preparation for it. I am anxious that this should not be repeated, for with the practically unanimous support of those who really know the capability of submarines against an Empire such as ours, I affirm unhesitatingly that the reasons, and the only ones, navally speaking, that we scraped through the last war were that the submarines opposed to us were of the wrong type; that latterly the *personnel* was inferior in training and discipline; that this provision of the wrong type enabled us to gain relief from convoy and form an auxiliary patrol of small craft. It also caused offence to America and so saved us; we may not have such luck again.

Admiral Sturdee tells us that the Falkland Islands battle shows us we must have surface vessels to protect our trade routes. Will he tell us what he would have done if von Spee had submerged? Here is a concrete case at last. Would not the Falklands be better provided with submarines and aircraft? They at any rate *might* catch the future von Spee on the surface. They could have reached these islands just as quickly as our battle-cruisers, and they would not have required re-fuel on arrival. Again, what could 100 Sydneys have done if the *Enden* had been able to submerge? This is the real issue.

AIRCRAFT AND SUBMARINES.

At present, with Naval Estimates of 90 millions and Air Force at 23 millions it looks as though we were half-heartedly progressing to the inevitable result. The aircraft will certainly be required anyhow. My contention is that there is a limit to retaining the old weapons and trying to pile all new ones on top of them. The money spent on capital ships would be better expended upon increasing our reserves of food supply or even in building up a reserve of merchant tonnage if we cannot guarantee our trade against heavy losses.

Finally, I claim that a Naval policy based upon aircraft and submarines affords us the only hope of protecting our trade—the main purpose of our Fleet—and that such policy will save us many millions on other estimates besides the Naval ones, and will ensure us a reasonable hope of command of the air in the next war, without which all effort will be futile.

As the daily list of tonnage lost grew and grew during the last war, though I thanked God and an unoriginal enemy that it was not nearly as bad as it might have been, I would not have wondered if the Admiralty had had broken windows. The transfer of the Navy to the air and a development of that under-water will bring us back more nearly to the days of fair fight, when our flag flew proudly, not in ships chased from port to port by an inferior enemy, unable to perform any of the duties for which they were intended. Should we not go out and seize such an opportunity with both hands? We have enough money and our men have ample grit.

THE NAVY: AN ILL-CONCEIVED INQUIRY.

Leading Article, "The Times"
(December 14).

The country has recognized during the last fortnight that the future of the Navy is paramount among the problems which confront it. That recognition has been so unanimous and so unquestionable that it has had a profound effect upon the Navy policy of the Cabinet. The Board of Admiralty, it is admitted, had committed themselves to a programme of new capital ship construction; and the Government, it is surmised with every circumstance of credibility, had acquiesced—whether tacitly or explicitly—in the proposals of the Admiralty. But so strong is the case for keen and expert inquiry before entering upon

new commitments in warship construction that the Government have yielded to the demand for investigation—one of the few instances, by the way, since the Armistice, of such condescension. Yielding, however, they have attempted to make some show of having their own way. The inquiry is to be committed to the Imperial Defence Committee, which meets to-morrow to begin it. The Committee consists of Ministers, with a sprinkling of admirals and generals. Sailors are a negligible minority of its members. The Ministers who form its bulk are busy men, without technical knowledge, and of all men least suited, whether by temperament or opportunity, to the patient and laborious investigation of the complex of highly technical questions which must arise in the course of any serious inquiry into the future of Navy policy, construction and equipment. The Imperial Defence Committee, too, had the unenviable reputation before the war of being a device for interposing a buffer of indeterminate authority between the Cabinet and the great spending Departments. In its nebulous atmosphere, responsibility for expenditure became so diluted that it could never afterwards be fixed upon any individual Minister—far less upon the Cabinet as a whole.

There is more than a suspicion now that the PRIME MINISTER'S sudden reference of the Navy problem to the Imperial Defence Committee is designed to have much the same result—satisfying for the time public anxiety for an inquiry, and yet enabling the Government to escape responsibility for the ultimate decision of Navy policy. It is a clumsy device, for the country is quite capable of appreciating the fact that the Ministers who have a decisive voice in the Committee are the Ministers who control Cabinet decisions. The PRIME MINISTER declared yesterday that the Committee will summon to their aid all the expert advice they can. But even with all available expert aid summoned, the Committee is unfit by its composition to conduct the inquiry which the sound instinct of the country demands. That inquiry should be expert throughout, and should be conducted by experts—Navy and civilian—on the most rigid lines of scientific investigation, in the light of the war experience of the Navy's fighting men. On its results the Cabinet should form their Navy policy, which the Imperial Defence Committee should then apply—in consultation with the Dominions—to safeguard the security upon the seas of the whole Empire.

REPLY TO ADMIRAL WAYMOUTH.

From Admiral W. H. Henderson
(December 14).

Sir,—The question of the capital ship was not seriously raised till 1914, and has only become acute owing to developments which have taken place during the war. Admiral Waymouth's questions in your edition of yesterday are therefore impossible ones.

So far as I am aware, no one who thinks the days of the capital ship are over imagines, or has suggested, the abolition of surface craft. On the contrary, they realize they will have to be maintained in large numbers, and be adapted and developed both for anti-submarine warfare and the attack and protection of commerce.

W. H. HENDERSON.

REPLIES TO ADMIRAL HALL.

From Commander W. P. Koe
(December 14).

Sir,—Rear-Admiral S. S. Hall in his letter which you publish in your issue of the 7th inst. states that our main naval purpose, the protection of our trade, could not be carried out in spite of many advantageous circumstances, and yet that this failure was not due to any naval shortcomings in leadership, *personnel*, or material. I submit, in all humility, that this is a very sweeping statement on his part. At any rate, it is misleading, for there might be shortcomings apart from those that he particularizes.

Assuming that leadership (afloat), *personnel*, and material were the most perfect imaginable, what was there at the commencement of the war, and for an indefinite period beforehand, to ensure the proper application of these elements in war? In short, what preparation for war, as opposed to one or more gunnery and torpedo encounters at sea, was there? The reply is, "Little or none." Why? The answer is simple enough. There was no Staff. No specially trained and specially organized body to think out possibilities in war, to consider and elaborate alternative policies in war, to devise methods of waging war, to contrive measures against any possible (not alone probable) action of the enemy in war.

The enemy submarine campaign was not officially foreseen. Any conception of it was left to one or two imaginative writers of fiction. Why? again. Because there was no official Department of Imagination! It is idle to talk of pre-war "war courses," or of this or that idea put forward by this or that great man, sup-

ported by his own particular following (and vehemently opposed by his enemies). Lord A may have always been right and Lord B as invariably wrong, but what has this confusion to do with organization for war? It is the most obvious of platitudes to say that war is a business, and no business would prosper if conducted by spasmodic brain waves on the part of individual directors. The managing director would go on strike forthwith.

This brings us to the point. Who is the managing director of a fighting service—in war and in the preparation for war? The answer is plain. Call him by what title you will, the managing director is the Chief of the General Staff, not, of course, as an individual, but as the head of a specially trained body of men so organized that different groups of them can contribute each and every element that makes for success in the business—of war. No such body can be improvised, nor indeed be produced and developed, without long and systematic training of the individuals composing it; nor can it function effectively without careful adjustment of its machinery to that of other Departments of the State—or of other fighting forces which are concerned in the comprehensive undertaking of warfare. Does anyone in his senses pretend that any such "war machine" existed at the Admiralty either before or during the war? True, there was quite a numerous "Naval Staff" by 1918, but to all intents and purposes it was the merest improvisation, living from hand to mouth, and mainly occupied in trying to make up for lost time and in the improvisation of measures which should at least have been considered years before. The so-called War Staff of 1914 was as little like what an efficient "General Staff" should be as a boneshaker bicycle is like a Rolls-Royce car. Both bicycle and car run on wheels, and there the resemblance ends.

The Board of Admiralty was not as God made it, but what it had grown into since about A.D. 1839, when the amalgamation of the Navy Board with the office of Lord High Admiral brought about the submergence of a more or less practical war-making concern in the slough of departmental administration. Small wonder that "the Board" had no mines, hesitated about convoy, pooh-pooed arming merchant ships for defence, thought that superannuated steam yachts and 8-knot trawlers could overtake 18-knot submarines, provided no protected base for its Grand Fleet, and insufficient destroyers for any practical purpose whatever. "Boards" are "boards," whatever brilliant, gallant, efficient individuals they may contain.

I suggest that to wage war successfully there must be adequate war-making machinery. We had not got it—with the result that we were all but defeated at sea—not in battle, but *in war*.

Yours, &c.,

W. P. KOE.

From Admiral Sir R. H. Bacon
(December 14).

Sir,—Rear-Admiral S. S. Hall in his article in your issue of the 11th inst. states that the German capital ships could not have interfered with the cross-Channel traffic had the enemy won the battle of Jutland. Winning a battle is a term difficult to assess strictly, but had Germany possessed capital ships and had we possessed none, what that country could have done can easily be stated. I would remark that I speak with the authority of one who commanded the Dover Patrol for the three most anxious years of our war at sea. A division of large ships escorted by destroyers would in one daylight raid have entered the narrows of the Channel, blocked Dunkirk, Calais, Boulogne, and the berths at Folkestone, and destroyed all the shipping in the Downs, without being in any way deterred by the threat of submarines, which the war proved to be useless in attacking battleships when properly escorted. They could also have done considerably more, which it is not necessary to specify. The lessons of the war when read sanely show two things so far as capital ships and submarines are concerned. First, that submarines are useless in attack on a properly organized fleet; and, secondly, that ship construction modified by war experience reduces the terror of torpedo warfare to a level far below that of pre-war anticipation.

I am, &c.,

R. H. BACON, Admiral (retired).

UNSERVICEABLE BIG SHIPS.

From Mr. H. Murray
(December 14).

Sir,—The opinion of the Consulting Civil Engineer of the Admiralty, 1860-70, my father, Andrew Murray, C.B., may be of interest at the present time of the "big ship" controversy. His firmly expressed opinion was then that big ships would grow in size and costliness till they became unserviceable, and that the future Navy of Great Britain would be myriads of small vessels with high seaworthiness and extreme velocity, and carrying one very long-distance gun or possibly two (fore and aft), which should swarm like flies in all the harbours of the world.

Yours truly,

H. MURRAY.

A REMINDER.

From Admiral Sir Percy Scott
(December 15).

Sir,—I think that yours is a most unsatisfactory newspaper. You do not give me an answer to the question I have asked—namely, "What is the use of a battleship?" A paper with a reputation like that of *The Times* ought to be

able to answer any question, especially such a simple one as that is. You have practically at your command all the brains of England; you have agents in every part of the world; you must know "What is the use of a battleship?" Why will you not tell me? I am very much annoyed with you. Why do you not act up to the world-wide reputation that *The Times* newspaper has always enjoyed, and most justly earned?

I am, yours,

PERCY SCOTT.

A REPLY: THE HOUSE THAT JACK BUILT.

From "Naval Staff Officer"
(December 15).

Sir,—In reply to Sir Percy Scott, on the lines of the well-known nursery rhyme I would say the capital ship is:—The ship that sinks the enemy's capital ship, that protects the cruisers that sink the cruisers which protect the destroyers, that sink the submarines that attack the merchant ships, that bring the food that feeds the people who build the ships that transport the army that defends the house that Jack built—the British Empire!

Yours faithfully,

NAVAL STAFF OFFICER.

'SURFACE-SHIPS, SUBMARINES AND AIRCRAFT.

From Captain W. H. Sayers
(December 15).]

Sir,—The pro- and anti-submarine admirals having more or less fully expressed their views on this vital question, perhaps you would publish those of one whose sole qualification to speak is that he was during the whole war a member of the R.N.A.S. and the naval side of the R.A.F., and that he had very fair opportunities of learning something of the relative effectiveness—as weapons of naval warfare—of the submarine, of the surface ship, and of aircraft.

The recent war proved the submarine in its present state to be a serious danger to enemy surface-ships of all kinds; but it also proved that, subject to proper precautions, the submarine cannot at present clear the seas of surface ships with any certainty. It proved equally that aircraft, in their present state, are a serious danger to enemy submarines, but that aircraft could not clear the seas of submarines or of any other type of water craft. It is a perfectly legitimate deduction from present experience that ultimately the submarine will be developed to such a pitch of perfection that no purely surface-bound craft will be able to face it in war. It is equally legitimate to deduce that later still aircraft will reach such a stage of development that they will be able to render the seas untenable

by any water-bound craft. But these deductions have no direct bearing on the subject now at issue, which is: What must be the composition of the British Navy of the next few years? This must be governed by the capabilities of the surface-ships, the submarines, and the aircraft which it is now possible to build.

The lessons of the late war in regard to aircraft, submarines, and surface-ships are merely the lessons of all past wars. New methods of attack breed new methods of defence, and they, in their turn, new methods of attack. At sea attack by submarines has developed a defence from the air as well as from the surface and from below it. Attack from the air has developed defence by high-angle fire from the surface, as well as defence in the air. It is desirable that every such ramification of attack and of defence be thoroughly explored, and to ensure such exploration it is necessary that each particular instrument of war should have enthusiastic supporters to urge its claims. But it is no business of the Board of Admiralty to be partisans either of the big ship or of the small, of the submarine or of aircraft. It is their business to consider what naval weapons can be produced at the present time, and what are their probable capacities and their possible limitations; and to provide as far as possible a force which shall be effective in all eventualities.

It were futile to build submarines and nothing else in the face of the possibility that really effective methods of attack on them from the air may be developed, which, being ineffective against surface-ships, would leave the seas open to enemy capital ships. It were equally futile to concentrate on aircraft, or on capital ships in the face of the possibility of similar contradevelopments rendering these useless.

The next great war will be a very different affair from the last in the matter of the technical equipment and armament of the belligerents. Other things being equal, victory will go to that side which has most thoroughly explored the possibilities of all the arms which can be used, and has wisely decided as to their relative value. Therefore naval and military programmes at the moment should be research programmes, and the wider the scope of the research the better.

I am, Sir, yours faithfully,
W. H. SAYERS.

SURFACE SHIPS ESSENTIAL.

From Admiral A. W. Waymouth
(December 16).

Sir,—Admiral Henderson, in his letter in *The Times* of to-day, makes the following important statement:—

So far as I am aware, no one who thinks the days of the capital ship are over imagines, or has suggested, the abolition of surface craft. On the contrary, they realize they will have to be maintained

in large numbers, and be adapted and developed both for anti-submarine warfare and the attack and protection of commerce.

With this statement I am entirely in accord, but there is another phase of the question that appears to have been entirely overlooked, and that is, we must possess sufficiently powerful vessels to be able to carry the war into the enemy's country, seek out and destroy his fleet, capture his coaling stations, destroy his harbours, docks, and fortifications, and, if necessary, bring about the capitulation of his important coast towns. And for this purpose we must possess vessels of great power, carrying the heaviest weapons and so protected that they can pass through minefields, be impervious to torpedo attack, and be protected from the effects of gunfire.

This, of course, is the ideal, and it will be no doubt very difficult to obtain all these qualities in one ship, but it does not take much imagination to improve immensely on the existing design of battleships, which are undoubtedly very weak in all these points. I have myself a design in my mind's eye that would meet most of these requirements, and would submit it if called upon to do so. The German ships were undoubtedly much better protected in these respects than ours. Their power of flotation was much better, the protection of their magazines infinitely better. The destruction of two ships at the battle of Jutland can be attributed directly to the "bare charges" and poor protection of magazines.

It is admitted that we shall require a large number of surface craft. What is the design to be? And here we come back to the same problem that has faced us for years. The destroyer was built to outrun the torpedo-boat, the light cruiser to beat the destroyer, the armoured cruiser to beat the light cruiser, the battle cruiser to beat the armoured cruiser, and so on. The same thing will occur again, but the *crux* of the whole situation is that the nation that possesses the most powerful surface craft—call them battleships, capital ships, or what you like—will dominate the naval situation.

Yours truly,
A. W. WAYMOUTH.

WHY BUILD BATTLESHIPS?

From Another Flag Officer
(December 16).

Sir,—May I be permitted to express my entire concurrence with the views expressed by Admiral Henderson in your issue of December 11, which to me appear to put the question of the future of the capital ship most admirably.

The degradation of the battleship from her former pride of place as the supreme fighting

integer of a fleet has been steady and progressive ever since the invention of the Whitehead torpedo. Its first manifestation was her dread of being in the vicinity of hostile torpedo craft by night, of which we saw plenty of evidence in the Chino-Japanese and Russo-Japanese wars. But at that period only the first downward step had been taken, and she held her own still in the daytime against anything afloat.

Then came the submarine, and with its introduction the battleship became just as much afraid of being outside her base in the day as in the night. When she ventured into the North Sea at all in the late war, she rushed about at full speed in constant apprehension of this new and invisible danger, and hurried back to shelter without delay when her immediate duty at sea was over. A hundred years ago the ship of the line would heave-to close off an enemy's port and lie there for days, so long as it was not a lee shore. Nowadays, the vicinity of an enemy's port is the last place her successor is ever to be found.

We are constantly being told as a reason for building more of them that the capital ship was the foundation of our sea power in the late war. So she was, but only because the enemy's sea power took the same form. If the Germans had devoted the forty millions which they spent on this class of vessel to constructing submarines instead, they might have possessed some three or four hundred of all sorts and sizes of the latter, in addition to the few that they did possess, and in that case Great Britain and her Allies would most certainly have gone under.

Is it not the fact that the tendency to cling to the capital ship is very largely the outcome of the intense conservatism of the Navy, to which Admiral King Hall referred the other day in your columns? Many examples are on record of the delay to progress arising from the dislike of the Service to new ideas. When steam propulsion was first under consideration for the Fleet, a specially appointed committee of admirals and captains condemned the proposal in unmeasured terms. It was only with the greatest difficulty that Cowper Coles induced the Admiralty in the early 'sixties to give up building wooden broadside liners in favour of armoured turret ships, that could sink them in half an hour. Muzzle-loading guns remained with us for years after they had disappeared from every other Service of importance in the world; and to come to more recent times, when the design of the Dreadnought was first made known, half the senior officers then afloat said they preferred the King Edward VII. class which preceded her.

As a last instance, may I quote a case in which I was personally concerned? The year before the war I happened to be present at a discussion on submarines arising out of the performances of a "D" class boat in the then recently concluded man-

œuvres, which were rather significant. Among others present were four admirals holding high appointments. In due course I was invited to express my views like everyone else round the table. I said I could arrive at no other conclusion than that submarines were going to make matters very uncomfortable for surface fleets, not only in such places as the North Sea but in many other areas, and I wished we were building far more ourselves. The three senior officers present all declared I was much too "pessimistic," and I was not asked for any more opinions. The fourth said that even if submarines did prove to be dangerous, "we must go on building battleships." They all agreed that if we went to war with Germany it might be risky to operate close to the German coast, but saw no reason to expect that the enemy's submarines would cross to our own.

Many people are contending that because the United States and Japan are building capital ships we must do the same. Granted that we must uphold our place on the seas as a first-class naval power, why must we follow instead of leading? If the argument is pushed to its logical conclusion and other countries reverted to building sailing 74's, we ought to follow their example. Let the events of the war speak for themselves in the simplest form by putting to ourselves the question as to how many of the fourteen British battleships lost were destroyed by battleships? Not one.

Yours faithfully,

ANOTHER FLAG OFFICER.

ANTIDOTE FOR SUBMARINES.

From Commander Boothby
(December 16).

Sir,—There is a good old saying to the effect that "When the salmon fight the trout should clear out of the pool," but may a small sea-trout venture a word in this most interesting discussion?

Without entering on the controversy as to whether capital ships are required or not, few people will quarrel with Rear-Admiral Hall's statement that the danger to our trade in future wars lies in the submarine cruiser. Every poison has its antidote. The suggestion is made that merchant ships should be armed with 6in. guns. Good; but what chance would they have against submarine cruisers armed with 12in. guns and protected by armour? Secondly, it is proposed to escort the convoys with our own submarine cruisers. It is pre-supposed that the enemy submarines work in squadrons; therefore ours must do the same, which means a squadron with each convoy—hardly feasible. Thirdly, that the convoy be escorted by aeroplane-carrying ships. Excellent—till the aeroplane-carrying ship is sunk, and one may be sure she would get the first round when the submarine attacks.

The case for the airship as the antidote to the submarine is as follows. During the late war for very many months no convoy escorted by an airship was attacked. She joins the convoy and stays with it, proceeding at the convoy's speed. The airship is absolutely immune from incendiary attack when filled with helium. This gas is now going to waste in the British Empire, but the Americans are wisely husbanding their supplies and prohibiting its export. An airship three times the displacement of existing ones can go round the world without re-fuelling, and this long endurance makes her very suitable to cope with the submarine cruiser. If a submarine is sighted on the surface she can attack it by means of a wireless controlled bomb from long range or drop a torpedo-carrying seaplane to attack from close range. If the submarine submerges she can stay there till it comes up or hunt it by means of the hydrophone. So long as the submarine is kept down and its rough locality known it is harmless to convoys.

The conclusion drawn is that for every possible enemy submarine cruiser laid down two airships should be constructed. They are cheap compared with large submarines. Their duty would be to mother that submarine, whatever part of the world she went to. One of them should be within a few hours' sail of it at all times.

The airship as a means of attacking commerce has not yet received the consideration it deserves, but I think it will prove that other airships are again the antidote. Rear-Admiral Hall touches lightly on the submersible tank, but I venture to prophesy that this weapon will yet provide much food for thought for a Ministry of Defence to coordinate all arms, which will be needed to deal with it.

Yours truly,

F. L. M. BOOTHBY.

BLUNDER WHICH WON THE WAR.

From Admiral Sir Percy Scott
(December 17).

Sir.—I wrote and abused you yesterday, but it has not had any effect. I got no answer from you or anyone else as to "what is the use of a battleship." All I want to know is what rôle our battleship is going to play if we are at war with a near enemy, say, France, a medium-distance enemy, say, in the Mediterranean, or a far-distant enemy in the East.

These three and many other phases of war must have been discussed and thoroughly thrashed out before our Admiralty decided to build a new fleet of battleships costing the country £9,000,000 each. Our Admiralty and foreign admiralities must know "what is the use of a battleship." The public of the

United States and Japan must know the use of battleships or they would not have subscribed the money to build them. The British public have not been told why (when we are so hard up) our already taxation to the limit should be increased by spending millions on battleships, which a midshipman tells me are "no damned good."

Their Lordships the Commissioners of the Admiralty, whose business it is to decide what units our Navy shall consist of, have, I understand, referred the decision of this very important but purely naval question to the Committee of Imperial Defence. This Committee is, I am told, chiefly composed of lawyers. These gentlemen may know all about the effect of the shape of the earth on a gyroscopically-controlled compass of a battleship, the blow-down valves of a submarine, and all the scientific and technical sides of the naval officer's profession. If they are well versed in all these subjects, they can with reliability answer the midshipman, and at the same time tell the country "what the use of a battleship is."

Now, Sir, you must admit that it is most important that the public who will be called upon to provide the money for building battleships should before they part with their money know of what service to the country these vessels are going to be.

You must admit that in the war we were nearly forced to submission by starvation.

You must admit that the German battleship played no part in reducing us to a state of starvation.

You must admit that if our battleship superiority had been double what it was they could not have protected us from starvation.

You must admit that the dominant arm of the war was the submarine. You must admit that our belief before the war that the submarine was only a toy resulted in our coming to the brink of losing the war. You must admit that this erroneous idea before the war resulted in our blunder of building the wrong weapons to combat the submarine.

Strange as it may appear, I believe that this blunder won the war for us. Looking over some German correspondence of 1914 which has reference to my letter in your paper proclaiming that the battleship was dead, I believe that the Germans, with their skewed minds, thought that I was not sincere (of course I was), but that I was trying to bluff them from building battleships. So they went on with their programme and did not build submarines.

Now my proposal to the Admiralty in 1913 was not to build two more battleships, but to use the money allocated for them in building submarines, aeroplanes, &c., and in not acting on my proposal I considered, and I still consider, that the Admiralty committed a colossal blunder.

Had the Admiralty not committed this blunder, but turned down two battleships, it would have conveyed to the Germans that the British Admiralty had full belief in the great utility of the submarine. They would have built them, perhaps have had 50 ready when war came, and we should now be a German colony.

People say that we always blunder through everything; the country must take its hat off to the Admiralty for making that blunder.

Now, Sir, as you do not appear to be susceptible to abuse, I must try love and affection by stating that I think the country owes you a debt of gratitude for throwing open your columns to this discussion on battleships, for it will greatly assist the committee who are going to decide "what is the use of a battleship?"

In your issue of to-day I see some very pertinent remarks by "Flag Officer." He reminds us of the fact that before the advent of the submarine the battleship did not feel very comfortable at night owing to the possibility of attack by torpedoes, but when the submarine came on the scene she did not feel comfortable either by night or day.

"Flag Officer" points out that in the olden day our battleships' place was off the enemy's port, but that they will not be there in the future, and, of course, they will not be.

The *new weapons* have entirely revolutionized naval warfare, and up to the present they have favoured defence much more than they have offence. They have given power to a weak country and taken it away from the strong. We must not try to fight our battles as we did when we had only bows and arrows. The rulers of our Navy must call in a doctor and get some medicine that will cure them of that terrible complaint, pigheadedness, or what "Flag Officer" out of politeness to *The Times* calls intense conservatism.

Admiral Waymouth says that our future battleship must be of great power, carry the heaviest guns, be able to pass through mine-fields, be impervious to torpedo attack, and be unaffected by gunfire. I do not understand why my friend Admiral Waymouth did not add that she must be able to fly and dive.

This pattern of vessel is at present not on the market. When they are every country will want a lot of them, and I shall be early in admitting that this battleship is the backbone of a navy.

Admiral Waymouth's idea of war is splendid. We must carry the war into the enemy's country, destroy his fleet, his coaling stations, docks, fortifications, and his important coast towns. Our battleships did all these things 100 years ago, but they did not do any of them during the last war. On the contrary, our battleships, if there were any submarines

about, kept well away from the enemy's country, from his coaling stations, his docks, his fortifications, and his important coast towns.

What is the use of a battleship?

PERCY SCOTT.

RECONSTRUCTION OF CAPITAL SHIPS.

From Commander J. Honner
(December 20).

Sir,—When in pre-war days Sir Percy Scott advocated the building of submarines instead of surface ships I criticized his proposals in a letter which you printed. The war experience has not led me to modify the view then taken on the main question.

Neither Sir Percy nor myself had the intuition or knowledge in those days to advocate the building of anti-submarine craft which, as events proved, was really the essential point. That capital surface ships are and will be for years to come the backbone of the Navy, from which must radiate the adjuncts of aircraft, surface and submarine cruisers, submarine torpedo attack vessels, and anti-submarine craft, &c., is, in my opinion the true policy. Many can remember the school of artillery officers which succeeded in getting the heavy field artillery suppressed in favour of light artillery. This policy cost many thousands of lives. With the Navy the life of a nation is at stake.

It is stated again and again that the capital ships of the Grand Fleet are obsolete. In their present condition perhaps so. But there are many fine ships amongst them which can be modernized and made good for at least ten years. The cost approximately might be £1,000,000 each, although in many cases half that sum would suffice. It is wrong to frighten the public with the statement that to bring the capital ship Fleet up to date it is necessary to build a number of £8,000,000 ships. The modernized Grand Fleet ships should meet all our requirements for some years to come. New construction can be confined to research work and the development of submarine craft for both attack and defence, anti-submarine vessels and appliances, and aircraft. All these are most important, requiring all the vigour that can be put into their development.

I hope that my point is clear. Do not use up financial resources in £8,000,000 ships when you can reconstruct at least eight ships fit for all service at the present for the same amount. Spend all that can be got on the ribs of the backbone. I venture to think that such a policy will keep us in the first place of the first-class naval Powers—whatever the cost, a position the Empire will not tolerate the loss of.

Yours truly,

J. HONNER.

ANTI-SUBMARINE DEFENCE.

From Mr. S. L. G. Knox
(December 20).

Sir,—I have been reading with much interest the discussion in regard to capital ships in naval programmes, in view of developments during the war in regard to submarines and aeroplanes. There is a phase of this question which I have not seen mentioned. It is quite possible that it is one that has serious weight with the Admiralty, but which they do not care to emphasize in defending their decision.

As has been often said, the weapon comes first, the defence follows. The war produced wonderful progress in attack by submarines and aeroplanes. The war ended just too soon to show what might have been done in the way of countering these attacks, especially by submarines. From the very beginning of the war I took the submarine more seriously than anyone with whom I came in contact, and my expressions regarding their potentialities, and the efforts and expense that were justified in seeking methods to counteract them, were met with scepticism, even in the highest naval circles. Yet I believe that if the war had lasted another six months the German submarine campaign would have been ended, either voluntarily or otherwise. The British Admiralty has undoubtedly still further developed new means of defence that were just coming to a head at the time of the Armistice. Also, judging from past experience, it is quite possible that even highly-placed admirals and rear-admirals may not be fully informed or take as seriously as they deserve methods of defeating the submarine known to those officially charged with the responsibility for the British naval programme.

In conclusion, it should not be forgotten that on the surface the submarine is, and always will be, very vulnerable to attack, and, submerged, it is, and always will be, very blind and relatively slow, compared with a surface vessel. So, if means of locating it, moving or at rest, exist, the odds are against it.

I am, Sir, yours faithfully,

S. L. G. KNOX, late Chief Consulting
Engineer, United States Naval Anti-
Submarine Station.

USE OF BATTLESHIPS.

From Capt. A. C. Dewar
(December 20).

Sir,—Sir Percy Scott asks plaintively, "What is the use of the battleship?" as if all uses could be expressed in concrete terms of gunnery parlance, such as "catch, retaining breech-block open." His answer is in the "House

that Jack built" by "Naval Staff Officer" in your issue of December 15.

Its use is to fight the enemy's battle fleet. If the enemy's battle fleet will not fight, it appears useless, but its potency is still there. Admiral Sidney Hall admits the comparative failure of the submarine, but attributes it to the use of a wrong type. He is of opinion that if the Germans had used submarine cruisers with guns they would have won. Well, they did use them, and they didn't win. They had several of them off the coast of the United States in 1918, and they didn't sink a single transport outward bound. In fact, only one loaded transport was sunk by a submarine (the *Tuscania*, off Ireland, in 1918). The advocates of the submarine have to explain away the indisputable fact that submarines never seriously interfered with the passage of our troops across the Channel. Sir Percy Scott attributes this to "dud" commanders, but it is absurd to talk in this way of men like Weddigen, Arnauld de la Perière, Max Valentiner, and a score of others.

Admiral Hall asks, "What would a hundred Sydneys have done against a submersible Emden?" The answer is that two of them would have escorted the convoy and there would have been 98 over. Evasion is a stratagem, not a weapon. You can't fight an escorting cruiser by diving. If a submarine cruiser emerges to fire on or to board a ship, it is merely a surface cruiser and a very vulnerable and inefficient one, for a single shell will prevent it from diving. It is incorrect to say that submarines never attacked battleships. For instance, Weddigen, who sank the *Cressy*, *Hogue*, and *Aboukir*, attacked the *Marlborough*, missed her, and was rammed and sunk by the *Dreadnought*. Scheer's Jutland sortie was based on submarines stationed off our ports to attack the Fleet going and returning. He had at least a score of them. Not one scored a hit. They had shots at the *Warspite* and *Marlborough*, crawling home, and missed them.

Admiral Hall asserts that the Audacious was sunk by a submarine, and though the point is not of great importance, it is as well to point out that Sir Julian Corbett attributes it to a mine. So did the Admiralty. So do naval authorities in Germany. No German submarine commander ever claimed it. Other ships were sunk on the same minefield. At least 60 mines were swept up there, and its position is given in the German armistice record.

Submarines and aircraft undoubtedly have a great part to play in naval war, but that does not necessarily mean the immediate abolition of the capital ship, which still represents the final argument in naval war. Its use is sufficiently stated in the letter mentioned above. It is unnecessary to fill the columns of *The Times* with an exposition of its general relationship to

naval strategy. This will be found in the pages of Mahan and Sir Julian Corbett.

I am, Sir, yours,
ALFRED C. DEWAR.

IMPOTENT BATTLESHIPS.

From Admiral Sir Percy Scott.
(December 21.)

Sir,—In your edition to-day I notice some letters about the battleships, but in none of them is there a satisfactory reply to my question, "What is the use of a battleship?" Commander Honner tells us that the "capital surface ship is and will be the backbone of a navy." Commander Honner adds that perhaps the capital ships of the Grand Fleet in their present condition are obsolete, but that they can be modernized at a cost of about one million each, and that this will suffice instead of building new ones.

Captain Dewar tells us that the use of a battleship is to fight the enemy's battle fleet; that if the enemy's fleet will not fight, the battleship appears useless, but its potency is still there. Our battleships that were in the Mediterranean during the late war displayed their potency by those of them that were not sent to the bottom of the ocean running away as soon as the German submarines showed themselves; I see no use in potentiality of this description.

Captain Dewar tells us that it is unnecessary to fill the columns of *The Times* with an exposition of the battleship's general relationship to Navy strategy. I am sure, Sir, that you would willingly give space enough in your valuable paper to anyone who would tell us what rôle our battleship will play if we are at war with France, or an enemy in the Mediterranean, or an enemy in the Far East.

When the battleships had a use our possible enemy was France, and we wished (in the event of war) to have our battleships as near that country as possible, and we strengthened and enlarged all our harbours on the South Coast.

Things have changed since then. During the late war Lord Jellicoe did not want his battleships near Germany; he wanted them as far off as possible compatible with being able to meet the German Fleet if it came out. He took the Fleet to Lough Swilly, in Ireland. Why? Because Scapa Flow was not safe against attack by submarines and torpedo-boats. It was not the German battleship that sent him away; it was fear of the torpedo.

If we go to war with a Power in the Mediterranean, what are our battleships that we have there now going to do? They must run to a safe harbour, if they can find one, before they are sunk. Those that get home safely can then display what Captain Dewar calls "their potency." It will not do anyone any harm.

Yours faithfully,

PERCY SCOTT.

THE ELUSIVE SUBMARINE.

From a "Q" Ship Officer
(December 21).

Sir,—As an officer who had the honour to command one of his Majesty's "Q" ships during the war, I am much interested in Admiral Sir Percy Scott's question as to the use of the battleship in the light of present experience and probable future developments.

I believe their use is of secondary importance to that of the submarine, light surface craft, or aircraft. Their probable use might be to give the *coup de grâce* should opportunity occur; to stand by in protected harbours (risking the airships), to come instantly to the assistance of our submarines or light craft outside, for the heaviest-armed vessel should always win, except for the submarine danger; to put fear into the hearts of a too adventurous enemy, who would send heavily-armed vessels into home waters to take prizes in the old way, if no such precaution was taken; and, finally, to carry the flag and take part in ceremony with a dignity befitting a great nation.

These, with a few well-known exceptions, were their chief duties during the late war; but the submarine would have won but for two special reasons. First, the mercantile marine of the Allied countries and the rest of the neutral world was so vast that the submarine menace could not develop quickly enough to cope with a reserve of ships which to them proved inexhaustible; next time this may not be so. Secondly, at a late stage of the war the authorities accepted a policy of convoys, the delay for which was said to be a shortage of light surface craft. A submarine, when attacking, had usually to take up a position ahead of an approaching convoy, single out a ship, fire her torpedo, and disappear; it was not to be expected that she would be able to attack a second ship in the same convoy, for the surface ships would be diligently searching the area and the convoy would alter course. Therefore the rest of the convoy would get clear till another submarine was met. With single combats different tactics would be used, and a ship was generally attacked from the stern, and was generally, especially if unarmed, fairly easy prey.

But during my command what struck me most was the feeling of utter helplessness, as a submarine gently disappeared from view, scarcely with a ripple on the water, and when you reached the spot, however carefully you may have thought you marked the position, there was nothing. Probably, for a variety of reasons, she would not attack the hunter, but she was there waiting for her next chance. I have seen them sink great ships, under my very eyes, within a mile or two of the English coast, without trace and with impunity. If by care you

could so manage that you hit one on the surface, of course she could not dive and would be fair game. But I believe, indeed I know, that the submarine fleet of the future—organized as Admiral Bacon would organize the fleet—would be a very terrible weapon and certainly a weapon to prepare all ready for the next war.

I have the honour to be, Sir,

Yours faithfully,

TEMP. AND ACT. LIEUT.-COM., R.N.R.

SIR PERCY SCOTT'S FLIPPANCY.

From Admiral Waymouth
(December 21).

Sir,—It is a pity that in dealing with such a serious subject as the naval supremacy of Great Britain Sir Percy Scott should indulge in flippancies and make impossible suggestions that may blind the eyes of some of the public who are not well acquainted with the requirements and possibilities of naval warfare. All my suggestions as to improvements in the type of future battleships are easily within the bounds of practical politics, and I can prove it.

Such absurd suggestions as:—

(a) A battleship diving or flying;

(b) The roofing in of harbours;

(c) Torpedoes to carry a ton of T.N.T.,

are so ridiculous that they require no comment from me or anyone else. There is an old saying, "Give a man enough rope and he will hang himself," and I fancy Sir Percy Scott has done this already.

Yours truly,

A. W. WAYMOUTH.

MATERIAL V. STRATEGIC SCHOOLS.

By Commander W. P. Koe
(December 22).

In all the clash of controversy over the question of big battleships or no battleships, or the provision of this or that weapon of war for the Navy, there must be a considerable number of non-combatants, spectators of the affray, who wonder "how these things are done"; who concocts a "programme" of shipbuilding or the like; and how many cooks go to the making of this particular sort of broth. Also, the more intelligent looker-on may wonder by what means and under what influences the cooks acquired their culinary skill.

I take it that it is at least arguable that in pre-war, or pre-Jutland, days, what may be called the "Material" school completely dominated naval thought. By force of the circumstances of their training, the vast majority of naval officers were steeped to the eyes in

"material," which possibly accounts for the fact that war was so often visualized as a mere conflict of a bigger this with a bigger that, to the complete detriment of any sound and comprehensive conception of strategy.

Probably of all the "Materialists" the most deeply-dyed were the gunnery folk, as they were also the most powerful. One wonders if they are not so still!

It is generally understood that the First Sea Lord of the Admiralty is now also Chief of the Naval Staff, and that the Naval Staff itself is divided into appropriate divisions for dealing with all questions of naval warfare. Also that any official opinion submitted by the Board of Admiralty to the Government of the day on matters of war is based upon that of the Chief of the Naval Staff, which again is based upon that of such staff divisions as he may have directed to report upon them.

Now the Naval Staff at Whitehall, as at present organized, is a plant of but recent growth and is something of a hybrid, produced by grafting a proportion of new ideas on to a stout stem of old ones. How stout, only those who assisted in the horticultural operation can appreciate.

If we take the new ideas to be, roughly, "comprehensively strategic," and the old ones as being represented by "material," it needs no expert gardener to see that there is a strong possibility of the plant growing up lop-sided, or of the original stem completely absorbing the added cutting.

COSTLY LEVIATHANS.

In this "great ship" business, with its rumours of stupendous craft armed with gigantic guns and protected with tremendous armour, costing untold millions of pounds apiece, it certainly looks very much as if our old friends the "Materialists" had gained the upper hand in the inner council of the Staff, though the inference may seem hardly justifiable to those who are not thoroughly conversant with the internal economy of the Staff and know little of the characters and idiosyncrasies of the body of officers composing it.

This much is certain—that there was, and is, a Staff Division of "new" colouring that was at its origin charged with the specific duty of studying questions of the future, and so on, to which things "material" would have to conform.

The "Materialists" hated it from its birth, and though unable to strangle it then, as the war was still in progress, it would be no surprise to the writer to learn that they have succeeded either in crippling it, or in so stunting its growth that it has become an enfeebled deformity.

If that should be so, the would-be murderers would, no doubt, be animated solely by the strongest sense of conviction that they acted for the best, "according to their lights," but would

stand convicted of attempted infanticide, nevertheless.

"Materialists" are not materialists from malice, nor, presumably, with any conscious ill-intent, but because they were trained to be so; their pre-war careers, promotion, and so on having been dependent upon their more or less complete absorption in their own particular line. And, as has been said, material dominated the Navy as a whole.

The *personnel* of the Naval Staff can only be drawn from the naval officers available, and until naval training is arranged upon such lines as will ensure that the "Material" is relegated to its proper place in relation to a wide strategic outlook, it will continue to throw its monstrous shadow athwart all programmes, proposals, plans, or projects of the Lords Commissioners of the Admiralty.

THE OVERSEAS STANDPOINT.

From Vice-Admiral R. H. Anstruther
(December 22).

Sir,—You are publishing correspondence on a most vital and far-reaching subject under the heading "Great Ships or — ?" and it behoves naval men to contribute such information as they can, gathered from experience of the recent war, towards arriving at the right conclusion.

Rear-Admiral Hall has contributed a very highly interesting series of articles, written with all the knowledge of the expert submarine officer and from that particular standpoint. I propose, if you will allow me, to take the overseas standpoint and to look at the question from the point of view of the distant, smaller Colonies, which are and must be in the "theatre of war" whenever England is at war, whatever their geographical position. I do this because it happened to fall to me to be responsible for carrying out the naval part of the official defence scheme of one of the richest and most distant of those Colonies—viz., Hong-kong—and when the Commander-in-Chief left the station I was responsible for guarding the trade routes between that port and Singapore. Admiral Hall quotes an Admiralty Memorandum of 1910:—

The really serious danger that this country has to guard against in war is not invasion, but interruption of trade and destruction of our mercantile marine. . . . The strength of our Fleet is determined by what is necessary to protect our trade.

Now, taking protection of trade and preservation of merchant ships as the main purpose of our Fleet, let us see how it worked out in the Far East.

The Emden started on her devastating career from Kiaochow, on the coast of North China, but she committed most, if not all, of her depredations in the Bay of Bengal and the eastern part of the Indian Ocean. Why? There were plenty of ships going in and out of Hong-kong

and other ports on the China coast, and yet not one merchant ship was sunk in the China Seas as far as I know. The answer I take to be that her captain knew there were British submarines on the China Station, and he had good reason for knowing that Allied cruisers were on the watch for him there. As time went on, other potential raiders, armed merchantmen, were ready and waiting to get to sea, but they did not succeed as they were prevented by our cruisers keeping a watch on them.

One very notable advantage we had in protecting Far Eastern trade was the fact that the Germans had no submarines out there. Surface ships could not have prevented potential raiders and supply ships from getting to sea if submarines had been about, because even if the cruisers had been able to discover and destroy the submarines, the raiders and supply ships could have escaped while the attention of the cruisers was diverted from watching the port, and in this way our trade would have suffered even more than it actually did, and Admiral Spee's communications would have been maintained.

Again, could we and the Japanese have bombarded the German base Tsingtau if there had been submarines in the harbour? To answer that it is only necessary to remember that a solitary German destroyer made a sortie from there and sank the Japanese ship that had temporarily taken the place of the Triumph. The place would have been a thorn in our side.

These are some of the thoughts which have occurred to me in connexion with the protection of our Far Eastern trade, and my conclusion is that submarines were of inestimable value to that trade, and that if the enemy had had submarines our surface ships could not have done as much as they did do to protect it. If the premise is correct that "the strength of our Fleet is determined by what is necessary to protect our trade," then submarines and anti-submarine craft appear to fulfil the conditions for an island colony overseas. At one time the China Station was almost entirely denuded of cruisers, yet Hong-kong shipping was never interrupted.

A powerful aid to trade protection would probably be found in building merchant ships capable of submerging on emergency.

Yours faithfully,

ROBT. H. ANSTRUTHER.

QUESTIONS ABOUT SUBMARINES.

From Professor T. B. Abell
(December 22).

Sir,—The publication of the *Jutland Papers*, following the letter from Sir Percy Scott dated December 17, prompts one or two questions. On the basis that the German submarines could not prevent the Grand Fleet leaving its bases on May 30, and that the British submarines did not

hamper the return of the German High Sea Fleet to its base *via* the swept channel, the public would probably like Sir Percy's opinion on the following questions:—

Can a fleet of submarines prevent the issue from its base of a surface fleet well screened by destroyers?

Can submarines, once an enemy surface fleet is at large on the ocean, prevent commerce destruction by that fleet?

Can submarines prevent a surface fleet at large from seizing a neutral or enemy base from which it can carry out destruction of commerce?

Did the German High Sea Fleet keep to its base for fear of our submarines and mines or for fear of our Grand Fleet?

The British public are not so much concerned for their money as for their lives. It is essential for our existence that the new fleet—assuming one to be required—should be of the right composition.

I am, yours faithfully,

T. B. ABELL.

FESTINA LENTE.

From "Pilot" (December 22).

Sir,—It is difficult to ascertain the opinion of the younger officers of the Fleet on this all-important question. May I give my opinion as being:—

Against any immediate programme of capital ships until their design has been more thoroughly considered in the light of facts which are only now emerging from the obscurity of the war?

In favour of a smaller proportion of large ships, but a larger proportion of light cruisers, destroyers, and submarines being kept in commission—since the latter classes train a better type of officers and men?

Absolutely against any policy of reconstruction of existing capital ships as an expensive and oft-proved futile proceeding?

In favour of some official encouragement being given to the consideration, by the mass of younger officers, of the lessons of the war?

I am, Sir, yours truly,

PILOT.

SUBMARINES: A REPLY.

From Admiral Sir Percy Scott (December 23).

Sir,—There are some letters with reference to battleships in your edition of this morning, but none of them answers my question. "What rôle will the battleship play if we go to war with France, or with a country in the Mediterranean, or with a country in the Far East?" Vice-Admiral R. H. Anstruther points out that "it behoves naval men to contribute such information as they can, gathered from experience of the recent war, towards arriving at the right conclusion," and in this I am sure that we all agree with him.

Vice-Admiral Anstruther deals with what is undoubtedly the main purpose of our Fleet—

namely, the protection of our food supply—and he demonstrates how the submarine governed the position in the East. We had submarines at Hong-kong, which prevented the German raiders from coming too near that port. The Germans had no submarines with them, and consequently could not attack our surface ships in the vicinity of that very important port.

Professor Abell wants me to answer the following questions:—

Can a fleet of submarines prevent the issue from its base of a surface fleet well screened by destroyers?

My answer is that determined men in the submarines would probably sink some of the surface craft in the daytime and the lot at night.

Can submarines, once an enemy surface fleet is at large on the ocean, prevent commerce destruction by that fleet?

My answer is: Yes; they can prevent commerce destruction by that fleet, by sinking that fleet.

Can submarines prevent a surface fleet at large from seizing a neutral base from which it can carry out destruction of commerce?

My answer is: Yes; submarines can go into the neutral base and sink the surface ships they find there.

Did the German High Sea Fleet keep to its base for fear of our submarines and mines, or for fear of our Grand Fleet?

My answer is: The German Fleet locked itself up in a safe harbour for fear of submarines, but if the war had gone on a little longer, this fleet in the supposed safe harbour would have probably suffered very much, not from our battleships, but from torpedoes dropped from aeroplanes. We were unfortunately a little late in having this new arm ready.

Although all these points, being brought under discussion, are very useful, they do not help to solve the question of, "What is the use of a battleship?"

Yours faithfully,

PERCY SCOTT.

USE OF BATTLESHIPS.

From Admiral Sir R. H. Bacon (December 23).

Sir,—The correspondence in your columns on the subject of naval construction, although most interesting, must have been confusing to non-technical readers. Even Sir Percy Scott calls loudly for some one to enlighten him on the uses of battleships to the Navy! May I occupy your valuable space, not to argue the relative merits of the submarine and battleship—to do so would occupy columns—but merely to point out why we build battleships?

The battleship is essentially the most heavily armed and best protected ship that can be produced. Its use is to destroy smaller and less strong vessels, and to impose its will on the

waters in which it cruises. One hundred years ago the battleship was supreme. Of late years the torpedo has destroyed this complete supremacy, since a pigmy in the shape of a torpedo-boat could sink a leviathan. The battleship fleet, therefore, has become a composite force, the battleship for offence, and destroyers to supply the defence not now inherent in that class of ship.

It may be accepted as a broad statement that if our possible sea enemies did not build battleships we also need not possess them. But an equally broad statement is also true—namely, that we should always possess ships one size larger and stronger than those of the enemy. Is it likely that our antagonists would allow this? Hence the climbing of the constructional ladder till each possesses battleships.

The questions of the moment are:—Whether the submarine is so certain in its destructive powers as to make the battleship useless? and next, Has the submarine made the existence of merchant shipping in war impossible? These two questions must not be confused. Since the abolition of sail power a battle fleet cannot protect merchant traffic directly; fuel consumption and the fewness of numbers, owing to high cost of construction, have completely abolished attack on merchant ships by battle fleets. Their convoy, therefore, by similar large ships is unnecessary. The question of commerce protection against submarines must not be confused with the necessity or otherwise for building battleships.

Battleships, as before mentioned, exist to impose their will in certain waters. A good example is given by the late war. Our battle fleet held the battle fleet of the enemy in check and prevented them from dominating the surface of the North Sea and Channel. It prevented them from being able to afford protection to vessels carrying troops to invade this country, and it prevented them from cutting off the supplies of our armies in France. There cannot be the slightest doubt that had we had no battle fleet these two objectives would have been the strategic aim of the enemy.

The crux of the present controversy, therefore, centres in the answer to the question whether submarines and destroyers could have prevented them from carrying out these projects. It is needless to enter on the thorny subject of military landings; it will be sufficient to point out that modern engineering skill can devise portable piers that dispose of the major portion of the attendant difficulties. The whole matter, therefore, rests on whether submarines and destroyers can be relied on to destroy a fleet of battleships. To argue out this subject would be impossible within the limits of a letter. It is merely possible to point out that no indication of this being the case was afforded by the late war, and also that the construction of the German battleships proved that the damage inflicted by torpedoes can be reduced to far

smaller proportions than was hitherto considered to be possible. The power of sinking a battleship with one, two, three, or even more hits has now vanished. It would be a leap in the dark to abolish battleship construction solely on account of a power that at present the submarines have not only not been proved to possess, but that the late war has indicated that they do not possess. Remember that if the industries necessary for the production of battleships, such as armour and heavy gun manufacture, are allowed to lapse, they can never be resuscitated during the period of a war.

The next point is a political one. Are the countries building battleships our possible enemies? This could only be answered by our skilled diplomatists, but can they confidently do so?

Lastly remains the question whether countries outside European waters can, in case of war, employ capital ships usefully against our Empire. This is too vast a subject for any but the Admiralty to investigate, and far too serious a matter to be settled by the off-hand expression of unguided individual opinions. Whether this country does or does not require battleships in the future depends rather on international relations and geographical considerations than on any disabilities in the vessels themselves.

I am,

R. H. BACON.

THE INEFFICIENT TORPEDO.

From Admiral Sir Reginald Custance
(December 24).

Sir,—Permit me to suggest that before the capital ship is condemned as obsolete some note should be taken of the qualifications of the submarine to take her place. The claims of the submarine seem to be based on the attributes of the weapon with which she is chiefly armed—the Whitehead torpedo—and on her power of evasion. Shortly before the war I examined closely the facts connected with the use of the Whitehead torpedo during the Russo-Japanese War and at our own peace exercises. The results of my inquiry were embodied in a paper read at the Naval War College on June 11, 1914, and circulated inside the Navy. The war facts showed only $5\frac{1}{2}$ per cent. of hits to torpedoes fired from small surface craft at single ships of war. A theoretical examination of the problem showed that the war facts were quite normal, and might be expected to recur in an immediate future war. The peace practices and experiments differed widely from the war results, and were misleading. The broad facts elicited were that the Whitehead torpedo is a short-range weapon, with which it is very difficult to hit a single ship in motion, and that as a weapon for use in surface ships it had fallen far below expectation.

The facts of the late war are not known to me, but must be in the possession of the Admiralty and have been examined by them. It is probable that they will confirm the conclusions drawn from the Russo-Japanese War.

The failure of the Whitehead torpedo in small surface craft was largely due to the difficulty in getting into position to use it at short range. This difficulty was reduced in the case of the submarine, which was able to close unseen and to torpedo several single ships of war at anchor, or stopped, or moving at slow speeds, during the early period of the war. The submarine was then able to operate with impunity, as no means existed for locating and attacking her when submerged. Such means now exist in greater or less perfection, and are doubtless open to improvement. In consequence the problem has been completely altered. Whereas the submarine, when submerged, was formerly immune from attack by the surface craft, she is now, when located, exposed to destruction by means of the depth charge. Further, she is without any effective means to hit back, seeing that the Whitehead torpedo is at a great disadvantage under such conditions. In fact, the surface craft is now more than a match for the submarine, which will be driven to the surface. Evasion is no longer possible, unless she quits the disputed area. She must fight, and can only hope for success when on the surface, where she will require a gun armament. May not the facts as to the accuracy of the bomb from the aeroplane under war conditions be as illuminating as are those of the Whitehead torpedo? Is it possible that reliance upon the principle of evasion has been pushed too far by the advocates of the submersible ship?

I am, Sir, &c.,

REGINALD CUSTANCE.

REPLIES TO CRITICS.

From Admiral Sir Percy Scott
(December 28).

Sir,—I have asked two questions; the first, "What is the use of a battleship?" To this, a midshipman has replied, "No damned use at all." Captain Dewar has told us that the use of a battleship is to fight the enemy's fleet; but that if the enemy's fleet will not fight then the battleship does appear to be useless; it is only its potency that remains, and the value of this asset I have already discussed. My second question was, What rôle our battleships are going to play if we have a war with France, or with a country in the Mediterranean or with a far-distant country in the East? Up to the present no one has cared to answer this very important question, upon which the building of our battleships should depend.

Surely we ought not to build battleships without knowing what their use is and what rôle they will play in battles with prospective enemies. It is so very easy to find out what their rôle will be. You have only to name the enemy and then have a war game. The battleships' rôle in the Mediterranean during the last war was to run away as fast as they could. Although no one has answered my questions, my asking them has given rise to expressions of opinion as to what battleships did in the late war, on the superiority in construction of our new battleships, and about the failures of torpedoes. These opinions are outside my question, but I will, with your kind permission, comment on some of them.

My friend Admiral Waymouth expresses regret that in dealing with such an important question as the use of a battleship I should indulge in flippancies and make impossible suggestions to blind the eyes of the public. In writing to you I am all sincerity, I am most faithfully expressing my opinion, and in so doing I wish to open the eyes of the public, and not to blind them. When the public read a carefully thought out answer to my two questions their eyes will, I think, be much more opened, and possibly their pockets much more shut against providing money for building battleships. To return to my friend Admiral Waymouth, for whom I have a great admiration, for he has invented several machines which have assisted in the destruction of our enemies. My gallant friend says that, according to the old expression, I have been "given rope," and that I have hanged myself; that I have made three suggestions so ridiculous that they require no comment. The ridiculous suggestions that he refers to are:—

- (a) A battleship diving or flying.
- (b) The roofing in of harbours.
- (c) Torpedoes to carry a ton of T.N.T.

As regards these three absurd suggestions, Admiral Waymouth may not know that I have on my table a drawing of a diving battleship of 10,000 tons, with attached to it an expression of opinion (from a very eminent shipbuilder) that the idea is quite feasible; this idea was sent by the inventors to the Admiralty, and they may be working on it now for all I know.

As regards the absurdities of a torpedo carrying one ton of T.N.T., I have a drawing of one carrying a ton of T.N.T. She is steered from the air by wireless, and a high official connected with the Air Service (Torpedo Department) tells me that there is no limit to the size of a torpedo; that torpedoes can be controlled from the air; that, in fact, they are at this moment controlling them from the air.

My other absurd suggestion was in connexion with roofed-in harbours. My friend Admiral Waymouth may not know that the Germans during the war roofed in harbours for their submarines. Admiral Waymouth may not

know that the Admiralty during the war contemplated making roofed-in bomb-proof harbours for airships, and that these harbours were of a size more than sufficient to take in a battleship. This was kept a great secret ; possibly the public and Admiral Waymouth have never until now ever heard of the idea. I ought to know a little about it because their lordships the Commissioners of the Admiralty ordered me to prepare the designs for these roofed-in harbours.

Here I end with my gallant friend Admiral Waymouth. I wish him a merry Christmas and some happier ideas of the rope being round my neck, because it appears to be a little doubtful whose neck it is round ; as the abby said in the old days, " I must leave this to you, Sir."

Having now perhaps riddled Admiral Waymouth, I will see what I can do with Admiral Sir Reginald Bacon. Before the war when I ventured to try to impress upon the Admiralty that the submarine was not the toy they thought it to be, but that it was really a terrible menace to the existence of this country, the gallant Admiral Sir Reginald Bacon wrote :—

It is rather astonishing to find Sir Percy Scott rushing into print and publishing views with an authoritativeness which can only be justified by an accuracy of knowledge which it is difficult to see that he has at his disposal.

To anyone with a sense of humour this statement was most amusing, for although Sir Reginald had been head of the Submarine Department he appeared to be quite ignorant of the weapon on whose potentiality he was supposed to be such a high authority. To make it more funny, Sir Reginald, because he did not understand, thought it rather astonishing that I should be able to write with any authority ; he implied that the bureau of common sense was not at my disposal. He forgot that it was part of my professional education to know about submarines. It is now quite clear that before the war Sir Reginald Bacon held very wrong views as to the potentiality of submarines, and to make it worse he published them. He may be committing the same error now. Let us have a look into what the opinions are that he now puts before the public to guide them as to whether they should put their hands into their pockets to buy battleships.

Admiral Bacon tells us that the Leviathan battleship's duty is " to impose its will " on the waters in which it cruises ; he tells us that the Leviathan can be sunk by a pigmy in the shape of a torpedo-boat. I thank Admiral Sir Reginald Bacon for this information, and hope that the Committee of Imperial Defence who are about to decide whether we are to have these Leviathan battleships or not will take Sir Reginald's statement seriously to heart. I gather that Sir Reginald does not suggest that the battleship imposes its will on the surface of the ocean when the pigmy has sent

her to the bottom of it. The pigmy in the Mediterranean during the war did send a lot of battleships to the bottom of the ocean, and they are there now I presume " imposing their will," but only on the waters in which they remain.

I am steadily wading through Sir Reginald's three-quarters of a column in your paper, but I cannot make much out of it, because when it comes to a point that the Committee of Imperial Defence will want information upon he says that it is impossible to deal with the question within the limits of a letter. The midshipman was able to deal with my question in a manner well within the limits of a letter ; he only trespassed on your space by one line—" The battleship is no damned good " ; he popped in where angels (if the Lords of the Admiralty are angels) feared to tread. The midshipman's line may set the whole world thinking what reply can be made to him.

Admiral Sir Reginald Custance is a great authority on naval subjects, I have always had great admiration for his composition and style of writing, but I have never been able to appreciate the subject-matter contained in his beautiful writing. The gallant officer now enters the arena, not to tell us " what is the use of a battleship," but to point out that before the war the results obtained from Whitehead torpedoes did not come up to expectations, and that it was found difficult to hit a ship in motion. Not hitting a ship may be due either to the torpedo's not running straight or to the officer manipulating it not having had sufficient practice and experience in its use. No weapon is of any use unless it is in skilful hands, and in the period under review by Admiral Custance the torpedoes' not coming up to expectations was probably due to the officers who manipulated them not being allowed to have sufficient practice in their use.

Admiral Custance must well know that during his whole career in H.M. Service paintwork was considered to be of more importance than gunnery or torpedo work ; we neglected instruction in these two important arms ; sometimes the practice ammunition for the gun was thrown overboard, and the torpedo practice was more often avoided than carried out. As a consequence of this mad foolishness with the gun we could not hit a haystack a yard off, and naturally, as Admiral Custance expresses it, " the torpedo as a weapon for use in surface ships fell far below expectations." You could not expect any other result when the principal training given to our officers and men was in housemaiding H.M. ships ; battleworthiness was not considered.

Some people say that during the war the results arising from the torpedo fell below expectations. That statement requires some investigation. It is true that in the early part of the war our submarines got some sitting

shots but did not get their bird, but this was no fault of our gallant submarine commanders ; they did their work in getting the sitter, but the Admiralty had supplied them with dud torpedoes. During the war I am told that the efficiency of our torpedoes and the officers who directed them increased by 500 per cent.

Admiral Sir Reginald Custance has told the public that the torpedo was inefficient prior to the war ; he did not tell the public that the cause of its inefficiency was Admiralty foolishness. He left me to explain this ; I have endeavoured to do so, because I wish the public's eye to be opened, not blinded. Admiral Sir Reginald Custance, having presented the public with a very wrong view of the potentiality of the torpedo as a weapon of war, then proceeds to convey to the public an almost entirely fictitious version of the present state of attack on submarines. He wishes the public to believe that the submarine is dead, that the surface craft is now more than a match for the submarine, that she can be located and attacked, when she is submerged, by depth charges. He implies that the depth charge deals certain destruction to the submarine ; I wish, with your permission, to tell the public that this is all twaddle, for hundreds of officers and men who have been depth-charged during the war are now enjoying their Christmas dinner. The depth charge is far from being a certainty. Every snipe you fire at does not die ; you see the snipe, but you do not see the submarine. Sir Reginald Custance wants the public to believe that we have a gun with which you can hit what is under water and you cannot see. I say to the public that we have not got this gun yet. The submarine has adopted the tactics of all birds and animals. The brains of these creatures, I suppose, tell them that the greatest security against attack is not to be seen.

I venture to think that it is not a bad idea. By experience I have found (to use Admiral Bacon's metaphor) that the animal very often imposes his will of not wishing to be dead on the sportsman who wishes him to be dead. How clever the animals are ! I wish they could speak, for they might be able to tell me what the use of a battleship is.

PERCY SCOTT.

SUBMARINES AND STARVATION.

From Admiral Sir Lowther Grant
(December 29).

Sir,—“Retired Admiral” asked very pertinently in a recent issue of *The Times* what would have been the result of the war had the Germans in the years preceding it built submarines rather than battleships. It appears to be admitted that we should in that case have lost the war by starvation (food and supplies

generally) had we not met such action by ourselves ceasing capital ship construction and devoting our attention to counter-measures. In other words, our Grand Fleet of capital ships would not have saved us, and Germany would have won without them.

Sir Percy Scott's question then remains to be answered, “What [would have been or] is the use of capital ships ?” Their functions defined, it would remain to determine the most suitable dimensions, speed, and armament.

The whole question is one of very great difficulty, and it seems that embarkation at the present moment on a programme of huge and costly capital ships is to be deprecated for the following reasons :—

(1) That it is at least doubtful if money spent on capital ships at the present time is wisely spent.

(2) That having regard to international condition at the present time, expenditure on capital ships is in any case not essential, and the condition of our national finances renders unessential expenditure inexcusable.

(3) That any action on our part not essential to national safety tending to produce a competition of armaments among nations would under present conditions—when the whole world is crying for peace, a League of Nations or some equivalent and reduction of armaments—be little short of criminal.

Yours faithfully,

LOWTHER GRANT.

AIR POWER.

From Major-Gen. Sir William Brancker
(December 29).

Sir,—In the valuable and interesting discussion which has taken place in your pages concerning the value of capital ships, no one definitely representing the Air has taken any part. As a firm believer in aviation and its power in the future, I venture to put forward a few remarks.

The question at issue is the value of capital ships in future war. In the discussion that has taken place it has several times been urged that attack from the air will render capital ships useless. Is this a fair claim for aviation ?

Aircraft can attack ships by two methods—by means of bombs and by means of torpedoes. The accuracy of bomb-dropping leaves much to be desired, and will do so for many years yet, by reason of the factors in the problems which remain to be solved. I take it also that a ship can be protected against bomb attack by adding armour to her deck ; provision must already be made against high-angle fire, and a bomb attack is only an aggravated and somewhat inaccurate form of high-angle fire. As an aviator, I would not venture to claim that capital ships will be driven off the face of the sea by bomb attacks

on the air; but this new form of offensive action will certainly necessitate modification in design, and will also make the high seas a safer place for capital ships than crowded anchorages, so far as aviation is concerned.

Torpedo attack from the air offers much greater possibilities. Let us compare this form of attack with a torpedo attack from destroyers. I would claim for it at least equal accuracy; actually it will probably prove superior in this respect on account of better visibility and comparative absence of motion in heavy weather. Its speed will be at least three times as great, thus facilitating surprise to a degree which has hardly been realized. The difficulty of hitting the attacking aircraft must always be considerably greater than that of hitting surface craft on account of the unknown and variable factor of height and of the higher speed of the attack. Further, an attack from the air can be delivered against ships lying in harbours and anchorages, where it would be impossible for destroyers to penetrate. There are, of course, antidotes to torpedo attack—nets, "blisters," and so forth—of which I am not qualified to speak. So, to my mind, the problem of the naval experts in dealing with the threat of aerial attack is to decide whether capital ships can be employed efficiently if they are liable to be attacked both at sea and in harbour by a torpedo assault which will be perhaps six times as efficacious as that delivered by destroyers.

To go a step farther: some writers have stated that the duty of the Fleet is to destroy the enemy's sea-bases, coaling stations, fortifications, and commercial harbours, and others have contended that submarines have rendered such enterprises impossible. But they will *not* be impossible to aircraft, and I am certain that, in the future, the Air Force must become *par excellence* the arm of offence against hostile territory and commerce. If this is admitted, then the proportion of the money available for armaments allotted to the Air Force, as compared to the other services, must be very high. If this high allotment to the Air renders the allotment to the Navy insufficient for the construction of capital ships, then they *must* go. No nation can neglect power in the air in order to preserve a form of defence so expensive in its maintenance and so problematical in its utility.

Yours faithfully,

W. S. BRANCKER.

BIG SHIPS NOT OBSOLETE.

From Rear-Ad. Sir S. Eardley-Wilmot (December 29).

Sir,—The assertion that the torpedo has killed the battleship, rendering undesirable further construction of that type of war vessel, has apparent, but no real, justification. The reason why this weapon exercised such great

influence in the late war was because we had not diligently sought for an antidote. Previously we had found an antidote for each new weapon of naval warfare as it was introduced. When the terrific effect of shell was observed on existing ships armour foiled the attack. When the gun beat the armour we improved the protection.

The struggle between them has continued to this day. We did not at any time say:—"The hundred-ton gun is supreme, why build any more big ships!" What a different procedure with the torpedo! It was a very crude weapon at first, and the Navy ignored it. Its gradual advance to present-day efficiency is as interesting a tale as how the 32-pounder smooth gun grew into the 18in. rifle breech-loader. How did we meet that advance? First by giving a ship a crinoline of wire netting, which could only be carried when stationary. At sea, when most required, it was worse than useless. We associated with it sub-division of the vessel into as many water-tight compartments as could be conveniently arranged; but it is obvious that certain large spaces could not be so treated, and the torpedo striking and exploding against those portions of the hull, sunk or disabled the ship. The submarine is only deadly because it carries this weapon, and has a better chance of applying it with effect than a destroyer or torpedo-boat. Apart from that it has little value, while the battleship can carry heavy guns, armour, coal, troops, and an immense quantity of stores. Can it not be constructed to afford as reasonable security against the torpedo as armour does against the gun? Certainly it can, as the "blister" principle demonstrated in the late war. To put armour on the bottom of a ship would not avail. High explosive rather likes rigid resistance, and the more weight you put on the hull under water the less weight the ship will carry. Hence the skin of a steel or iron ship is thin, rendering her an inviting object for the torpedo. To overcome its effect you must allow the heated gas to expand before reaching the side of the vessel, or gradually absorb its energy by mechanical devices, such as are applied with wonderful efficiency to curb the recoil of an 18in. gun when fired. If more powerful torpedoes are produced the defence can also be increased. I believe it is quite possible to design a battleship or large cruiser to withstand the explosion of a torpedo charged with half or even a ton of T.N.T. She would not then be scared by a submarine menace, and would retain all those qualities which no other craft combines.

The protection of our ocean commerce must be effected in a different manner, but it would make this letter too long to deal with it here. I am now chiefly concerned to show cause why the capital ship need not be considered obsolete.

Yours,

S. EARDLEY-WILMOT.

From Professor T. B. Abell
(December 29).

Sir,—To some of the leading questions addressed to Sir Percy Scott in my letter of December 22 he and Admiral Sir Reginald Bacon return different answers. The questions were put solely to concentrate attention on the principal aspects of the question so far as it can really appeal to the non-technical public. To every new weapon a defence—never complete, but always approaching completeness—is always set up. Until this war the torpedo was never a proved weapon. Ships can be built to resist this by no means effectively directed weapon. That the submarine is an extraordinarily serviceable craft is obvious. That it will develop in effectiveness and in scope no one who knows the work done by the Admiralty designing staff, including the members of the Royal Corps of Naval Constructors, will doubt. But from the correspondence on the matter from naval men of great experience in the recent war, and from others, it will appear to the layman that the time for dispensing with large surface vessels is not yet.

It must be remembered that the *raison d'être* of the Navy is, first, the maintenance of our food supply, and, secondly, the maintenance of our commerce. Submarine, surface, and aerial craft all seem necessary for these purposes.

I am, Sir, yours faithfully,

T. B. ABELL.

THE GREATEST EMPIRE PROBLEM.

From Rear-Admiral S. S. Hall
(December 30).

Sir,—My object in this discussion has been to point out the failure of our Fleet adequately to protect trade in the last war, to try to show that the system of simply adding to everything with a lavish outlay in men and money, even when supported by all the navies of the world, in a most favourable position, was not a satisfactory system even in the face of the poorly conducted attack on our trade that we then had to deal with. Now that our resources are much restricted, with no prospect that we can rely upon a repetition of so much assistance from allies, upon such a favourable position or upon such an inferior attack and with the additional air menace to our trades, I endeavoured to find some more reasonable basis upon which to make our preparations for future security.

To those of your readers who are interested in this as the problem of our Empire, and not as a purely naval argument, it will come as a disappointment that the ground of the discussion has been largely shifted to that of the comparative merits of a submarine and a battle-

ship in competition. None of my critics has given us any ideas upon the protection of trade nor have they as much as mentioned aircraft. When they maintain that we must still build battleships, I presume they mean stronger, faster, and more expensive ones.

This means larger and more light cruisers and destroyers to protect them, more aircraft to scout for them, more protected bases for them, more auxiliary patrol to compete with submarines further afield, and much more convoy protection against submarine cruisers. The whole of this must then be multiplied by two or three to make up for a certainly less favourable geographical position and a possible falling off in the number of allies. Truly this is, as one correspondent put it, a case of the house that Jack built, and where is the money coming from to build it with?

I turn with relief to the pertinent questions of Professor Abell and to the letter of Admiral Sir Reginald Bacon. The question of the moment is certainly this: if battleships are not to be the basis of our fleet, what is the damage we can suffer from a nation that continues to build them? Both of the letters to which I refer deal with this crucial question as though we were only to have a submarine fleet, though no one, as far as I know, has ever advocated sole reliance on submarines. Sir Reginald Bacon says that :—

Whether we do or do not require battleships depends rather on international relations and geographical conditions than on any disabilities in the vessels themselves.

This is the point which I thought I had laboured, that when considering the powers for evil of an unopposed battle fleet, it is absolutely necessary to know what it is doing and above all how far has it come.

A fleet of battleships could still proceed to sea in the last war with comparative safety provided always it maintained a high speed and was well screened by destroyers against submarines. But covering the whole operation is the question of time and distance: the destroyers' oil is fast running out, the hostile aeroplanes will be back in an hour with fresh torpedoes; the submarines can stay there for weeks, but the fleet must be quick, for they have to get back.

What can they do? Directly they come within 100 miles of our coasts or of our oversea bases, the attacks on their escorts will commence, and as these become reduced, the battleships become more vulnerable; as the armada gets closer the mining service will come into play and attacks by aircraft will get more frequent; all the torpedo, bombing and fighting air craft within call—and it is an increasingly wide call—can be concentrated on the advancing fleet. What can they do in the time at their disposal? No doubt the Committee now sitting will have the time and information necessary to examine the concrete situations in which a possible enemy has capital ships and we have none.

This is the vital matter, and so I do not propose to answer those critics on side issues who want to know why submarines did not sink everything afloat in the last war, or whether a torpedo is better now than it was in the Russo-Japanese war! Surely they sank enough to satisfy most critics; even our own sank over 50 warships and there were few about.

There has been nothing yet written to shake my confidence in the necessity for now providing for naval defence by thoroughly efficient air, submarine, and mining services. All these are mobile and economical. They are available for protection of home and oversea bases and for the defence of trade. They can protect themselves and the place they work from, and do not run the risk of having to wait in harbours (which must in any case be defended by the three services I have named) for a battle which may never come.

Perhaps the strongest reason of all, which I have kept to the last, is that battleships cannot take the offensive: they hand over the initiative to the enemy. They did so in the last war and all the time we went about feeling as though we were being kicked, with all the will and means but no power to kick back. We talked of digging out rats, but battleships were of no use for it, and they never will be; it is air mastery alone that can give us the power of a vigorous offensive;

S. S. HALL.

SUBMARINES AND AIRCRAFT.

From Admiral Sir R. H. Bacon
(January 1, 1921).

Sir,—One point that has apparently escaped Sir Percy Scott's attention is that the German submarines by their unrestricted sinking of merchant shipping won us the war. The view held before the war by many of us, including myself, was that submarines were unable to distinguish the shipping of neutrals from that of belligerents, nor could they rescue the crews of sinking vessels; a submarine campaign therefore against our shipping in war would be a suicidal policy for any enemy to indulge in. Neutrals would inevitably be forced into the war by the wholesale piracy involved in the attack on their vessels.

In the main we were right and Sir Percy Scott was wrong. This country was never near starvation, either in food or raw materials, the passage of our troops over the seas was unimpeded, and as soon as we obtained an efficient naval mine and adopted a system of convoys, the power of the submarine was broken. The illegal use of that class of vessel against neutral shipping brought the United States of America into the war at a moment when the increased moral thus afforded was of the utmost value to the Allies. It is well that America was with us in the winter of 1917 and in the spring of

1918 when the armies previously opposed to Russia flooded over to the Western Front. At that time any wavering would have been fatal. The German Army perhaps now bitterly regrets that their High Command followed the policy indicated by Sir Percy Scott, which, without doubt, lost them the war. Sir Percy Scott will for years to come be remembered and honoured by the British Navy, but our thoughts will centre on his great genius as a naval artilleryman, and not on his efficiency as a minor prophet.

It is hardly fair to non-technical persons for Sir Percy Scott to base his contention that a battle fleet is impotent in the face of submarines largely on what took place in the Mediterranean during the war. Let me remind your readers that the British battleships which were sunk in those waters were obsolete ships, battleships only in name, used as floating batteries and unprovided with adequate destroyer support. Although called battleships they neither exercised the functions nor had the composite organization of a battle fleet. It is futile to argue that battleships of modern construction, organized and employed as a battle fleet, will in future be useless because floating batteries or isolated ships were torpedoed in the Mediterranean. That no better evidence can be gathered from the whole history of the war is proof of how utterly Sir Percy Scott's contention is unbacked by experience in the late war at sea.

Yours faithfully,

R. H. BACON.

From Flight Commander J. G. Struthers
(January 1).

Sir,—The views of one who spent, in the air on the anti-submarine and convoy patrol, actually months of each year during the critical 1916-18 period are offered with diffidence, but in the hope they may be of some interest in your correspondence "Great Ships or — ?"

During this period the writer, flying various types of airships and in different areas, escorted thousands of ships and numerous convoys. The most obvious feature to him was the wonderful invisibility of the enemy submarine, and on the few occasions the latter was seen and attacked—although a very thorough look-out was kept—it was almost entirely the submarine's own carelessness, want of patience, &c., that led to his discovery. It was very clear that the submarine need never be seen from the air unless unforeseen accidents occurred. It was also obvious that the enemy submarine did not make the most of his chances, and that with a little more initiative on his part there would have been a different story to tell to-day. In fact, one is entitled to say that with the knowledge gained, with the improved submarine, and given ordinary *personnel*, material, and initiative, even the convoy system would now be a failure.

The opinion confirmed by these thousands of hours' flying (sometimes nearly two days with

one convoy) was that the day of the purely surface war vessel was over. But what was more apparent was the immense advantage the surface vessel would have could it submerge at will. The supreme war vessel of the future is undoubtedly going to be an aerial one. To escape, therefore, from its observation or attack, a surface war vessel should be capable of submergence. Now the battleship, to put it crudely, is merely a gun platform, which at the moment has grown to a "great" size and is consequently a more vulnerable target from the air and to the submarine. Surely her value would be much better utilized by distributing her guns amongst smaller units capable of emerging, firing their salvos, and submerging at will, and in a remarkably short space of time.

The writer does not see how anyone can fail to agree with Rear-Admiral S. S. Hall on the subject of "Great Ships or — ?" For instance, referring to Admiral Bacon's letter in *The Times* of December 14, would not raids on Dover (or anywhere) be at least more effectively carried out, and with greater hope of success, were the attacking forces to approach within range submerged before discovering their presence? Finally, the modern cruiser submarine is capable of inflicting unthinkable damage, possibly annihilation, on our overseas commerce.

I am, Sir, &c.,

J. G. STRUTHERS.

On January 3 Sir Percy Scott announced in the letter published below that he had been invited to place his views on "the use of a battleship" before the Sub-Committee of the Committee of Imperial Defence. His letter gave the first news of the constitution of the Sub-Committee.

SIR P. SCOTT AND THE SUB-COMMITTEE.

From Admiral Sir Percy Scott
(January 3).

Sir,—For about three weeks I have been asking you to get an answer to my question, "What is the use of a battleship?" You have only succeeded in obtaining some clap-trap nonsense, but no real answer. This morning I received a letter marked "Urgent and secret."

I am supposed to be fool enough to think that this labelling of the letter will preclude me from making public what is in it; the trap is not good enough; the authorities must bait their trap with some better stuff to catch me. "Urgent and secret" on a letter will not terrorize me from making use of that letter if it is in the interests of the country that I should do so. That is trap No. 1.

I am not going to fall into this trap, because

I will not regard their letter as secret; there is no secret in it. It has been published over and over again that the Committee of Imperial Defence are going to meet and consider a reply to my question, "What is the use of a battleship?" Of course, in public offices time always hangs wearily on their hands; they cannot make use of my short phraseology. They say that the Committee of Imperial Defence will carry out an exhaustive investigation into the whole question of naval strength as affected by the latest developments of naval warfare, and that they will take evidence upon the question of the capital ship in view of modern scientific developments and experiences of the late war.

Now we come to trap No. 2. The letter tells me that the Sub-Committee to investigate the question consists of Mr. Bonar Law, Mr. Churchill, Mr. Long, Sir Robert Horne, Sir Eric Geddes, and Admiral Beatty, and that Mr. Bonar Law asks if I am prepared to appear as a witness before the Committee, and will I let them have a paper embodying my views. The letter credits me with being such a fool that I cannot see that it is only a clumsy trap to muzzle me. I hate being treated as an incompetent fool, and, of course, I am not going to muzzle myself by attending the Committee's meetings; and as regards my views on the battleship, the Committee can learn them by reading my letter to *The Times* of December 15, 1913. My views have not changed since that date.

The Committee are going to decide the question of "What is the use of a battleship?" As I do not know what her use is, obviously I cannot be of much use to them; but what I have done will be of use to the Committee, for I have, through your courtesy, elicited three answers to the question that they have to decide. The answers are as follows:—A midshipman says that the battleships are of no damned use; Captain Dewar says that the use of battleships is to fight the enemy's battleships, but that if the enemy's battleships will not come out to be fought, they are of no use; Admiral Sir Reginald Bacon tells us that the use of a battleship is to impose her will upon the water. These three answers ought to be of great assistance to the Committee, and I hope that the Committee will bear in mind that 90,000 tons of battleships were sent to the bottom of the ocean during the war. Sir Reginald Bacon says that these were only old battleships; he reminds me of the housemaid who had a baby, but excused her indiscretion by saying it was only "a little one."

"Jackie" Fisher set a trap for the Germans; he built a Dreadnought. The German Kaiser fell into the trap; he started to build Dreadnoughts, and spent millions in widening his canal to get them through it. How naughty of "Jackie" to impose upon a soldier! If the German Emperor had only spent the price of one battleship on submarines his country residence—or one of them—in this country would have been Windsor

Castle. How irritating his little mistake must be to him now, for what was the use of his battleships? The Committee of Imperial Defence are now going to tell us of what use our battleships are; it will be a New Year's greeting.

PERCY SCOTT.

GUNS V. TORPEDOES.

From Admiral E. R. Fremantle

(January 3).

Sir,—Sir Percy Scott is fond of asking questions, and he sometimes answers them; so, with your permission, I will ask him one or two.

(1) Is he prepared to base our naval power solely on submarines, or on a combination of air force and submarines?

(2) Does he consider that the torpedo in action showed itself the master of the gun, in the fights of the war? I need scarcely refer to Coronel, the Falklands, Heligoland Bight, the Dogger Bank, where the torpedo was scarcely in evidence at all except possibly in the apprehension of men too appreciative of its danger. But what about Jutland? At Jutland there were no submarines. How could there be? A submarine on the surface can steam 12 knots, and I fail to see how the Admiralty or Admiral Jellicoe can have expected submarines to have kept company with fleets steaming 17 to 20 knots, but the torpedo was made full use of by Von Scheer in his desperate and at least partially successful effort to release himself from the grip of our battle fleet, and our destroyers made full use of it in the night action.

What, then, was the bag due to—the gun or torpedo? The losses caused by the former consisted of four battle cruisers, three armoured cruisers, and numerous destroyers. The torpedo, on the other hand, could only boast of the destruction of one pre-Dreadnought battleship and serious damage to the Marlborough, which was not, however, put out of action.

As one of the "as beens," as sailors would say, although I have my ideas as to the course the Admiralty should adopt, I would rather leave the difficult problem to the Admiralty and the men of recent war experience, but I certainly should not advocate a programme of £9,000,000 battleships in competition with America, and I would urge free recourse to experiments both with aircraft and submarines. I may mention that 35 years ago, when there was a naval panic on the appearance of the fast torpedo boat, a motion was made in the House of Commons to stop the building of the Nile and Trafalgar battleships then in course of construction. I wrote two articles, one in the *Nineteenth Century* and the other in *Blackwood*, pointing out that the too previous conclusions of the French authorities, including Admiral Aube, then Minister of Marine, and of many of our naval officers that the big ship was obsolete, were

erroneous, and I would now venture to state the position as follows:—

(1) Trade will continue to be carried by surface ships in the future as in the past, and it must be mainly protected by ships of a similar character.

(2) The futurists who are so confident of the victory of the submarine should not be blind to its deficiencies and to the inventions which are limiting its offensive power. Admiral Sims tells us in his book of the success which has attended the location of submarines by sound, and that the larger class of submarines which crossed the Atlantic to attack American commerce averaged a speed of five knots, and that difficulties were experienced in submerging these large vessels. I would venture to say, in conclusion, that however excessive Admiralty conservatism may have been in previous periods, it has often saved us from the adoption of wild schemes advocated, and while I fully appreciate Sir Percy Scott's determination to force attention to all modern conditions of naval warfare, I think that we should be wise to leave the naval shipbuilding programme to the discretion of the Admiralty. Let us trust that the position may be eased shortly by a good understanding with the United States, which I am glad to see advocated by men on both sides of the Atlantic; it is even referred to favourably by Mr. Josephus Daniels, the protagonist of American naval expansion.

I remain, yours faithfully,

E. R. FREMANTLE.

A NAVY TO KEEP THE SEAS.

From Admiral W. H. Henderson

(January 4).

Sir,—In the discussion taking place in your columns there is a tendency towards confusion of thought, with the result that the real issue before the Empire is lost sight of.

The problem before the nation is:—Does the existing type of capital ship fulfil our present and prospective strategical requirements? It is not:—Is the so-called capital ship in any other form obsolete? It can be conceived that 10,000-ton cruisers may become the capital ships of the future. Sea-keeping capacity is as important a factor, or more so, than guns, torpedoes, and armour. A shipowner who had much experience of the war operations writes me:—"Some of the writers seem to have given but little thought to what naturally strikes me as the main issue—the cargo steamer. I detect—or fancy I detect—something of the notion that opposing fleets would meet each other in duly appointed lists, like the tourneys at Ashby-de-la-Zouch; and, short of that, I don't see how any battle fleet of big ships could force its will on an enemy with a gigantic population and any number of harbours thousands of miles away."

"Naval Staff Officer," in your issue of Dec. 15, used nursery-rhyme reasoning to bolster up the battleship. Unfortunately, naval strategic problems require a different method of approach, and, if his letter represents the doctrine and teaching of the Naval Staff, Commander

Koe's strictures in his letter of Dec. 14 and in his special article of Dec. 22 are certainly well founded and should be inquired into. The Staff is not yet permeated with trained Staff officers, and apparently the *matériel* school still holds sway.

Admiral Bacon, in your issue of Dec. 23, put forward the use of the battleship under the conditions of the late war against European enemies. I do not admit that such arguments are correct ; but assuming them to be so it must be borne in mind that no European Power is building, our existing Fleet is predominant in all types, and there is no justification whatever for any new building programme. We must look ahead, and not behind. In the last paragraph of his letter, in which he refers to the use of battleships in a war with countries outside European waters, he dismisses the subject as one too vast for anyone but the Admiralty to investigate and settle. But, as I stated in my letter of Dec. 11, this is really the crux of the whole problem, and if Commander Koe is right it is by no means certain that the Naval Staff is fully equipped to think it out. It is nonsense to suppose that no one but the Admiralty can usefully examine the question. It is a strategical problem which others can assist to solve, and, in assisting, possibly prevent the nation from being committed, through faulty reasoning, to the useless expenditure of many millions, which will increase each year at a progressive rate.

A capital ship for use in the Atlantic or Pacific Ocean must be able to keep the sea for long periods, carry its own anti-submarine offensive, and be independent of the host of auxiliary craft necessary with the existing types. The type may be surface, submarine, or air, or some combination—I do not pretend to know, but probably surface for the next dozen years or more. In the present state of our finances it must be a great deal less costly than existing types, and not necessitate huge undertakings in bricks and mortar for basins and docking purposes.

The history of the substitution of sails by steam is repeating itself. Whatever form the embodiment of the largest ships of a fleet may take, the type has got to be evolved. Lord Fisher clearly saw that the existing type of battleship was obsolete and useless for present strategical conditions, and it was this fact which in the closing months of his life induced him to advocate the policy of "scrap the lot." Vision is required in high quarters.

Meanwhile we should go slow, and, with what money we have to spend, study the problem before embarking on a shipbuilding programme. Other nations may have money to waste ; we cannot afford it. To spend millions on shipbuilding now means that every other naval service will be starved for years to come—training, staff, education, research, auxiliary requirements, and many others, all of which are vital. History will repeat itself ; we shall again begin

to think only in terms of Dreadnoughts, and should we be involved in war we shall have all the defects and deficiencies which Lord Jellicoe enumerates in "The Grand Fleet, 1914 to 1916."

W. H. HENDERSON.

WHAT IS A CAPITAL SHIP ?

From "Sindbad "

(January 4).

Sir,—As an ancient mariner, not without varied experience by sea, may I make a suggestion to the disputants in the interesting controversy now running through your columns ? Their views and assertions might be more enlightening if they were a little more constructive in their criticisms and a little more consistent in their terminology.

Historically speaking "a capital ship" is a term used to denote any instrument which is the arbiter of sea conflict, or provides, as Captain Alfred Dewar puts it, "the final argument in naval war." It may be either the long ship of the Vikings, the cog of the Middle Ages, or a wooden line-of-battle ship, like the Victory. Effingham, Blake, Rodney, Nelson, Lyons, and Jellicoe each employed a different type of capital ship, and there may well be as many more types of capital ship in the next 300 years. There is no reason why the capital ship of 10 years' time should not be as different in its design and features from the super-Dreadnought of to-day as that is from the Dreadnought of Queen Elizabeth's time.

This is evidently the opinion of some of the contributors to your discussion, and yet Admiral Henderson, Admiral Sir Lowther Grant, Major-General Sir William Brancker, and others, use the term "capital ship" as if it were a synonym for super-Dreadnought or battleship. This is, to say the least, very confusing. On the other hand, Sir Percy Scott, with his slogan, "What is the use of a battleship ?" appears to see the capital ship of the future in a diving battleship of 10,000 tons, or a torpedo carrying a ton of T.N.T. steered by wireless. Rear-Admiral S. S. Hall seems to prefer a submersible cruiser of 3,000 tons displacement and 5,000 miles sea endurance, while Commander Koe's substitute for the present capital ship is a high-browed Staff. Commander Boothby favours an airship with which to down the submarine, while Sir Sydney Eardley-Wilmot, with others, hints at a design of which no particulars are given.

The weapon of the capital ship of the past was the gun, and it was mainly improvements in the gun which brought about alterations in ship design. Now the capital ship has to meet the attack of the torpedo in its various shapes—surface, sub-surface, and aerial. What is surely wanted in this discussion is some one with vision to define the essential attributes of the future capital ship. The design of this vessel

must be such that, while providing adequate protection against the new assailants, it will enable her to carry into action the weapons which will give her the capacity to fulfil the function of her predecessors.

Yours obediently,

SINDBAD.

THE IMPERIAL DEFENCE SUB-COMMITTEE.

Leading Article "The Times" (January 4).

The composition of the Sub-Committee appointed to investigate the question of the future naval construction policy of the country is more interesting than satisfactory. It consists, as was announced in the letter from SIR PERCY SCOTT which we published yesterday, of one sailor, ADMIRAL LORD BEATTY, and five politicians, MR. BONAR LAW, MR. WINSTON CHURCHILL, MR. WALTER LONG, SIR ERIC GEDDES, and SIR ROBERT HORNE. As all five are Ministers, and all, except MR. BONAR LAW and SIR ROBERT HORNE, have, either to-day or in the last few years, held high office at the Admiralty, it is obvious that in appointing them the Committee of Imperial Defence have, from one point of view, not lost sight of the urgent and vital importance of the issues which they will be called upon to decide. But, after making due allowance for the eminence of their official positions, past and present, it must be admitted that though, between them, the five Ministers constitute a dazzling constellation of most of the political talents, their practical acquaintance with surface-ships, big or little, with guns and torpedoes, with aircraft and submarines, is necessarily limited. They are, moreover, exceedingly busy men, who cannot, while carrying on their regular work, be expected to devote to this extra subject the time necessary for the searching inquiry which it demands. The discussion in our columns of the relative value of capital ships and other craft by which they may be supplemented or replaced has clearly shown that the matter is highly controversial and primarily one for experts. Affairs of State and financial considerations must obviously enter into the deliberations of the Committee, and with these the politicians chosen are well qualified to deal, though it is difficult to see why so many of them are required. But they are not qualified to take on their shoulders

the whole burden of the technical inquiry, except that part of it which will be borne by ADMIRAL BEATTY. We live in an age of constant change and development in naval and military armaments and equipment. Only men of high naval and military and scientific training can judge, with any prospect of arriving at correct conclusions, of the lines on which future advances are likely to be made. The problem to be solved has to do with the needs not of to-day but of to-morrow and the day after. With the sole exception of ADMIRAL BEATTY, there is no member of the Committee who can pretend to the special knowledge even of naval matters which the adequate examination of the evidence to be collected will entail. It is at least possible that naval battles of the future will be mainly battles fought in the air. Yet the Committee includes no one in a position to speak with authority on the developments that even a few years may produce in this direction, or, to take another obvious example, in the use of new gases and explosives. The whole matter is far too serious for the very existence of the country to be handled in a way that provides any loophole for superficiality, and the Committee should be strengthened without a moment's delay.

THE SUBMARINE AFTER JUTLAND.

From Commander J. Honner (January 6).

Sir,—My complaint against Sir Percy Scott is that he is deceiving the public by treating the question from a purely material-technical standpoint. He either ignores or treats with scorn or sarcasm the other very essential factors which must in reality govern any decision on this momentous subject.

With all due respect to Sir Percy, his question, "What is the use of a battleship?" is taking the form of a parrot cry to which it would seem waste of breath to reply. This is a pity, as it will weary the people. But I will make an attempt to take up the proverbial Scotsman's attitude by asking Sir Percy another question, dealing with the sister Service. Sir Percy will probably reply that he is not a soldier and doesn't know; but I will ask him to give the analogy between the two his careful consideration.

"What is the use of infantry?" The combined efforts of machine-gun fire, high-explosive shell, attacks from aircraft, gas, &c., drove them underground and rendered them actively useless, as, in Sir Percy's opinion, the submarine drove the battleships into useless.

inactivity in harbour. But the *potential* power of the infantry remained during their enforced strangulation underground. When methods were found, after some four years, to allow them to become active again, they arose and finished the war. Would Sir Percy abolish infantry because they had to take refuge underground, as he wishes to abolish the battleships on account of their harbour refuge? He has been indignant because one writer pointed out that the power of the battleships lay in their potentiality. That officer hit the nail on the head. Potentiality is the rôle of the battleships; they have no other value. They may have to lie quiet for an indefinite period, a check to the enemy's battleships, and, when the time comes, to destroy them, and, in doing so, to destroy the *moral* of the nation behind them as nothing else would.

Yours truly,

J. HONNER.

From "An Officer".

(January 6).

Sir,—I was surprised to read in *The Times* of January 3 a letter from Admiral Fremantle, in answer to Sir Percy Scott, stating that the reason why there were no submarines at Jutland was because of their inability to steam 17 to 20 knots. This statement is correct, but he omits to say that shortly afterwards this difficulty was overcome. Perhaps he does not realize that not very long after Jutland the "K" class submarines proved themselves perfectly able to maintain the speed of the Fleet in all weathers, and to develop speeds of 24 knots and over when required for taking up a favourable position before submerging to attack.

Many times when present at tactical exercises with the Grand Fleet I have admired the way in which these submarines rapidly placed themselves in a very favourable position to submerge and attack, noting also that when on the surface they present about one-third of the target that the modern destroyer would, when in a similar position.

He also states that the gun accounted for more ships at Jutland than the torpedo. He fails to realize that if the German torpedoes had not suffered from the serious defect of having "visible tracks," their toll would have been far heavier. Incidentally, the Marlborough was placed out of action, as she was forced to seek port and part company with the fleet hours before the Main Fleet turned for home, thus not being available for any further action that might have developed.

There was only one known occasion when the Germans used all their available submarines in combined offensive operation against our Fleet, which resulted in the loss of the two cruisers Nottingham and Falmouth and the rapid turning away of our Main Fleet! I refer to the sally made by the German Fleet a few months after Jutland.

Undoubtedly the future naval policy should be decided by the Admiralty, but far more thought and experiment should be given to the branches of the future, and the younger officers who control these forces consulted. I refer to the Air Force, Torpedo, Mining and Coastal Motor-Boat Services. The torpedo and torpedo-carrying aircraft are developing so fast that by the time a squadron of capital ships is completed they will probably be several years behindhand in design. The question also arises of dock and harbour accommodation, because if we are to build and maintain a squadron of super-Hoods much money will have to be forthcoming. The torpedo and mining branches of the Service have always been heavily handicapped by lack of funds for experimental work and departmental jealousy, and it is only in recent war years that these arms have been able to develop and make the strides they have done recently.

Yours faithfully,

AN OFFICER.

"A HIGH BROWED STAFF."

From Commander W. P. Koe

(January 6).

Sir,—Your correspondent "Sindbad" in your issue of to-day says that "Commander Koe's substitute for the present capital ship is a high-browed staff." That I never made any such announcement does not perhaps matter very much, and what "Sindbad" chooses to imagine is beside the mark.

What does matter is this:—If the Naval Staff at the Admiralty is not the proper body to decide for the Government of the day what the national requirements for the proper and efficient waging of war at sea are, what person, or collection of persons, is? No other body can possibly be in possession of all the requisite data upon which decision in any such matter must be based, no other body is officially representative of naval opinion. Why, then, should the question of capital ships or any other naval weapons of war be referred to a Committee of estimable gentlemen only one of whom is a seaman? One can only surmise that the Cabinet mistrusted the advice tendered by the Naval Staff. Why should the Cabinet mistrust the advice of the Naval Staff? Again one can only surmise that the Cabinet doubted whether the Naval Staff, a comparatively new formation, had its internal economy so nicely balanced, its human constituents so carefully trained, so educated, as to produce a convincing argument. If such were indeed the case, why is the Naval Staff not in perfect equilibrium, and why is its *personnel* ill-educated for the duty it has to perform?

There can only be one answer, and that is that the Board of Admiralty for years set its face obstinately and persistently against the formation of an adequately equipped Naval Staff, and that even now there are many officers

of high rank, who may or may not be Sea Lords now or in the future, who, like "Sindbad," can find nothing better to do than fling some term of derision, such as "high-browed," at any conception of a competent staff, though they are not prepared to produce any practical proposal as an alternative (with the possible exception of "Leave it to Me"). If the Cabinet, as apparently it does, considers the Naval Staff for one reason or another to be incompetent, one can only wonder what steps it has in contemplation for the remedying of such an alarming state of affairs.

Yours, &c.,

W. P. KOE.

DISABILITIES OF SUBMARINES.

From Admiral Sir Herbert King Hall
(January 7).

Sir,—There is one aspect of the case in the discussion of battleships v. submarines which, so far, I do not think has been referred to, but cannot be ignored, and is this : So long as our trade is carried in surface vessels, what class of vessels must be used to protect it in convoy ? Is it possible to protect a convoy of surface vessels by an escort of submarines alone ? It would appear to be impracticable. For, assume an enemy surface cruiser or squadron of surface vessels is seen approaching a convoy escorted only by submarines, what is the escorting submarine or submarines to do ? If they submerge they at once lose most of their speed and will not be able to keep up with the convoy, the ships of which may be sunk by the long-range gunfire of the enemy long before the submarines can deliver an attack. If, however, to retain their speed they remain on the surface, they are to all intents and purposes no longer submarines. In this particular case it would appear that until the speed of submarines under water is equal to that of surface vessels they will certainly not be suitable for convoy work.

If this is accepted, and surface vessels decided on, what then is to be the limit of the size of the surface vessel, its armament and armour, and where does the battleship begin ?

Yours,

HERBERT KING HALL.

From Admiral Sir Reginald Bacon
(January 7).

Sir,—May I once more ask for the hospitality of your columns—not to argue with experts, but to emphasize a few facts not generally appreciated by the non-technical reader, which largely govern the use of submarine craft in war-time ?

A craft that navigates below water loses about 85 per cent. of her surface fighting efficiency

from constructional necessities. In other words, tonnage for tonnage, the fighting and scouting efficiency of a submersible craft is only about 15 per cent. of that of the surface vessel. All protuberances on the upper deck reduce speed below water : hence small numbers of guns, absence of high masts, and therefore reduction in range of vision, low freeboard, and comparatively low surface speed are some of the factors that reduce the efficiency of the submersible when on the surface. Vessels when submerged, at present, and at all events in the near future, cannot work together with any approach to precision. Their invisibility to other submerged craft deprives them of the great benefits of concerted action, which is the *cruz* of tactical operations. Further, any submersible craft is extremely vulnerable to gun-fire ; a single hit may often preclude her from seeking refuge by diving until the damage has been repaired ; and, lastly, the larger the submarine the more vulnerable she becomes to torpedo attack.

It is these disabilities which cause the practical naval officer unhesitatingly to prefer to use surface vessels in preference to submersibles for surface fighting and other operations above water. On the other hand, the ability of submersible craft to vanish from sight and to reappear at will endows them with a valuable method of defence, and a means of springing surprises on surface vessels. They need not rely on their speed to escape from surface fighting ships, hence they can carry fuel for very long distance cruises. The net result is that their functions in war are better suited for the attack of undefended ships than against fighting vessels.

In discussing attack on commerce one matter has largely been overlooked—namely, that "capture" is a far more effective form of warfare than mere sinking, since by capture, although still lost to the enemy, materials, riches, and ships become the property of the country to which the successful raider belongs. In order to capture ships it is necessary for the raiding vessel to carry prize crews to navigate the prizes and also to dispose of the crews of the vessels captured. These acts are not impossibilities to submarine vessels, but are most inconvenient, and are limited in extent as compared with the powers of surface raiders. Again, considerable risk is run in boarding ships with men from a submarine, since the vessel has to come to the surface, and expose herself to the dangers of hidden guns carried by the ship she wishes to board.

There is little doubt that surface raiders are far more efficient in a *guerre de course* than submersibles so far as capture of vessels is concerned. The submersible has, however, one great advantage in commerce destruction over the surface ships, and that is the ability to hide from vessels which are hunting for her. This, added to her large fuel-carrying capacity, makes it almost impossible to locate her in open waters.

Hence the necessity for the protection of merchant ships by surface vessels, or, in other words, for the system of convoys with all the consequent delays and inconveniences. The unrestricted sinking of vessels which simplified the operations of the German submarines is a dangerous game to play against neutrals, as was shown during the late war. To sink any vessel seen, without the delays and dangers of boarding, greatly amplified the power of the submarine, and lessened the dangers of its calling. It is doubtful if submarines will ever again have so easy a task in war. There was nothing in the late war to lead us to suppose that the protection of our commerce in future wars will be an impossibility. We will, of course, sustain losses, probably considerable losses, but let us be careful not to allow the advantages possessed by the submarine as a raider to blind us to the inherent disadvantages these vessels also possess. Moreover the country, without undue optimism, may well trust the sea genius of its sons, and believe that sea problems in the future will be solved by them as they always have been in the past. I am, Sir, yours faithfully,

R. H. BACON.

BATTLESHIPS FOR SALE.

From Sir George Gibb (January 7).

Sir,—If battleships are, as Sir Percy Scott shows, of no use to Britain, but are considered in America to have sufficient utility, under Transatlantic conditions, to justify building, why not make a good bargain by selling some of our battleships, thus enabling America, with advantage to both countries, to economize in her building programme?

I am, Sir, your obedient servant,
GEORGE S. GIBB.

USE OF BATTLESHIPS.

From Capt. E. L. Hughes
(January 7).

Sir,—Sir Percy Scott has been asking in your columns, "What is the use of the battleship?" May I endeavour to explain its use?

The main use of the battleship is to gain and keep command of the sea. In spite of the fact that our battle fleet was generally in harbour, it was the power and pressure exerted by that "battle fleet in being" that won the late war. It gave us the freedom of the seas, enabling us to beat the submarine and to bring troops and supplies from every corner of the globe, and it was the want of that power which denied to Germany the freedom of the seas and prevented her from gaining full benefit from the work of her submarines. Our efforts towards winning the war, both on land and sea, were almost all dependent on, and made possible by, our command of the sea. Had we been without a

battle fleet we could not have brought a single convoy into our ports, and the German fleet would have starved us into submission in a few weeks.

Replying to Professor Abell, Sir Percy Scott states that it was the fear of our submarines that kept the German fleet in port. Will he prove it was this, and not the fear of our battle fleet, that kept them in? The German submarines did not keep our battle fleet in harbour when it wished to go to sea, and there is no reason to suppose that our submarines would have been more successful. Will he explain, too, how it was that Germany, in spite of her great superiority in submarines and aircraft, failed to wrest the command of the sea from us, and was beaten, while we, with our superiority in battleships, kept command of the sea and won the war?

Submarines and aircraft will play an increasingly important part in future wars as auxiliaries to the battle fleet, but they will never take the place of the heavily armed and armoured surface ship. Their nature will always impose certain limitations and disadvantages on them as compared with surface craft, and as their powers of offence increase, so will the means of combating them improve.

Yours faithfully,

EDWARD L. HUGHES.

IN SERIOUS VEIN.

From Admiral Sir Percy Scott
(January 8).

Sir,—Through your courtesy I have been able publicly to ask the question, "What is the use of a battleship?" This question I ask in perfect sincerity, and I ask it for the benefit of the nation, because I think that we ought to have an answer before we build any more battleships. I have been trying to answer it for about eight years, but, under the altered conditions of naval warfare, I cannot see what rôle the battleship can play in future wars, and I have not been able to find anyone who can tell me.

In trying to arrive at the utility of the super-Dreadnoughts we must bear in mind that the earliest date on which the first one could be completed is the summer of 1923, and we must consider what improvements will possibly be made in the new weapons during that time. One thing that I think we can make sure of is that all seagirt countries will secure themselves against attack by building submarines and aeroplanes, and that they will devise a torpedo carrying a charge of T.N.T. sufficient to blow the bottom out of our £9,000,000 battleships.

We can take it as established that the battleship's weak part is her bottom and that it must be washed. These are the important points that the country has to consider.

During the war I was for a time head of the

Anti-Submarine Department in the Admiralty. I had to consider two things—(1) Means to destroy the submarine; (2) means to strengthen the battleship's submerged part against torpedo attack. I was able to call in all the expert ship-builders of England, France, and our other Allies, and my facilities were further widened by my being a member of the British Board of Inventions and Research. We were called the B.I.R.

This wonderful combination of talent and invention did produce improvements in the design of battleships, which gave them a better chance of remaining on the surface if holed by a torpedo of that date; but we found that the modifications in design would necessitate a great increase in the size of the battleship. Her tonnage would have to go up to somewhere between 40,000 and 50,000 tons. This was, we thought, putting a lot of eggs into one basket.

Then a man came along with a design of torpedo that would undoubtedly sink the clever designers' ship, so the Admiralty decided to build only one of the four ships on their programme. Thus was produced H.M.S. Hood. It is our latest attempt, I think it will be our last: she is obsolete, she can be sent to the bottom by a submarine.

The opinion of the Board of Inventions and Research (Jackie Fisher was the President) was that we could not build a battleship or any other ship with a bottom strong enough to withstand the attack of the torpedo, or a mine, and that there could be no limit to the size of these under-water weapons of attack.

Then we had to consider the size of a battleship. She wants her submerged part washed at least every six months, and to wash her requires a large bath. Admiral of the Fleet Lord Jellicoe has told us in his book that our battleships were more liable to be sunk than the Germans', because they had not beam enough (were not broad enough); that we could not make them broader, because our docks were not wide enough, that widening our docks would have cost a lot of money. This point has got to be considered now, if we decide to build super-Dreadnoughts.

It was all these considerations, and his uncanny looking into the future, that led Jackie Fisher to say "Scrap the lot: the future fighting is in the air."

To answer some of my critics. Admiral Waymouth says that I base all my arguments on the remark of some irresponsible midshipman. Perhaps from sentiment, I do attach importance to what this very junior officer said, and the reason may be that the last words that my midshipman son said to me were: "Father, if we have a scrap, our gunnery lieutenant says that we shall not have a dog's chance. The Germans will be pumping shell into us and our guns won't reach them by a couple of miles." That is exactly what did happen; and the poor boy, with 900 other brave officers and men, went to the bottom of

the ocean. A sensible Board of Admiralty could have averted this catastrophe. The remark, "Battleships are of no damned use," made by (as Admiral Waymouth says) some irresponsible midshipman, has at any rate called into existence a very strong Parliamentary Committee to consider it.

Admiral Waymouth says that I am not adding to my reputation in refusing to give evidence before the political gentlemen on this Committee. Why should I give evidence? I think that the irresponsible midshipman can hold his own with them. He is the one they have to deal with. The midshipman has expressed an opinion. He knows something; I am ignorant, so have only asked the question "What is the use of a battleship?"

Admiral Waymouth tells me that the political gentlemen who have been formed into a Committee to uphold or disapprove the midshipman's remark are men of common sense. This I am very glad to hear; but, still, opinions do vary as to the capability of these political gentlemen to deal with such a purely naval question as is involved in the midshipman's remark. One distinguished officer writes to me:—"Why did they not appoint on the Committee Mr. Justice Darling, George Robey, Hall Caine, The Bishop of London, and Father Christmas?" Of course, I cannot answer this question, as I am not a politician, but I should have liked to have attended the meetings.

A political gentleman also chides me. He says that the question to be discussed is of Empire importance, that the men appointed on the Committee are the shining lights of England, that no stronger committee to deal with a naval question could possibly have been formed, for among them are the First Lord of the Admiralty and two former First Lords, and that I ought to assist them? Now, Sir, am I not trying to assist them? Almost daily you are publishing opinions of great naval officers which must be of assistance. I in my small way have tried to help them by telling you of the housemaid who had a baby, but excused her indiscretion by saying it was only a little one.

The political gentleman who chides me is obviously not a naval officer, for he considers that First Lords of the Admiralty are great authorities on the technical questions of naval policy. In the Navy we do not think that. We have great respect for our First Lords, but we do not believe that a gentleman can be transformed from newspaper vendor, cavalry officer, lawyer, lunatic, or railway agent into a competent First Lord of the Admiralty within the time that the Opposition generally allow him to hold that office. In the political world funny things happen, but there is nothing more quaint than the birth of a "Ruler of the Queen's Navy." He springs from possibly quite low down in his own profession to the head of our

profession in one bound, and he has great power. Mr. McKenna kicked me out of the Navy. Mr. Winston Churchill forced out Jackie Fisher, and Sir Eric Geddes fired out Lord Jellicoe.

I hope, Sir, that I have not trespassed on your time too much, but I feel it my duty to assist in every way I can the Political Committee who are going to decide whether the irresponsible midshipman's opinion is correct or not.

PERCY SCOTT.

STALEMATE AT SEA.

From Rear-Admiral S. S. Hall
(January 10).

Sir,—“Sindbad,” in discussing the question of capital ships, accuses me of “seeming to prefer” a submersible cruiser of 3,000 tons with a surface endurance of 5,000 miles as the future capital ship. May I say, first, that the sea endurance of a submarine cruiser of this size may be fifty, not five, thousand miles; this is why she is such a potent commerce-raider; and, secondly, that I most certainly made no claim for such a vessel as an “arbiter of sea conflict”?

My argument is that there is no such thing now as a capital ship; the present so-called capital ship is a fraud. She is certainly the most powerful surface ship, and in the last war our Grand Fleet was the dominating factor, if you like, but it was certainly not the arbiter of the sea-conflict. The vital sea-conflict that went on without ceasing, certainly for two years, was a submarine war on our trade. It very nearly succeeded, and the Grand Fleet took no part in it. It was checked by various other means and because of the reasons I have given, which cannot occur again; but it was never stopped, and a very large submarine fleet was in course of preparation when the enemy suffered military defeat.

The advent of submarines inevitably produces a condition of stalemate at sea; you can never ensure clearing the sea of submarines, and therefore attacks on trade will persist, whether you annihilate the enemy's surface fleet, distantly blockade it, as in the last war, or even if he has none at all.

It is not the same difficulty that we had in the past with frigates, for they could be located and destroyed; the trouble is made more acute from the increased volume, importance, and vulnerability of our sea trade, and because submarines also prevent us from blockading the enemy's surface raiders as well as those that can submerge. There is no complete solution to the problem; even a definite means of locating and destroying submarines would be only partial, for there is now the air attack, and other

weapons are in sight, none of which can be supreme in itself, but which, combined, prevent any of the others from becoming a “capital” weapon. Stalemate at sea will be much easier of accomplishment in the future. It has always been more or less a feature of sea warfare, but not to anything like the extent it is now. All we can do is to reduce our losses to a bearable quantity, and the problem is how to do this most economically with the means at our disposal. I have tried to show that the method used in the last war is not applicable to the conditions now, and that the existing and projected form of the so-called capital ship is not the most economical means of protecting our trade.

If we are fearful of the damage to our trade from unopposed capital ships exceeding that we suffered in the last war from submarines, or, indeed, being added to it, then we want to know whether the possession of such ships by us will enable us to contain those of the enemy, and whether this is within our means. If the answer to both these questions is in the negative, as I maintain it is, then the Navy must devise means of defeating the probable enemy's capital ships. This is not as difficult a task as, for example, our military problem in 1914 or the submarine menace in 1916. There are not a great many of these ships; they are already very much restricted; they are, at any rate, large targets and on the surface. If it is made our serious business to defeat them, we can do it. We have never tried. Our auxiliary Navy has been disbanded. We have no Naval Air Service, and practically the whole of our naval effort is now devoted to the bolstering up of the so-called capital ship.

The accomplishment of this purpose, the final defeat of the mammoth surface vessel, will leave us with a more mobile and economical Navy, available for attack or defence, and not equipped purely for a battle which may never take place, and which will be indecisive if it does.

S. S. HALL.

CAVALRY AND SURFACE SHIPS.

From Lieut.-Colonel W. S. Whetherly
(January 10).

Sir,—It may appear a little out of place for a cavalry officer to contribute to the correspondence in your columns on the subject of battleship or submarine, but I trust you will allow me to occupy your valuable space for the following reasons:—

1. A vital interest, as a soldier, that clear thinking on sound principles shall guide our future naval policy; for upon this must continue to depend our rôle of Expeditionary Force, the great weapon of our sea power.

2. A fellow-feeling, as a cavalryman, who recognizes in the mentality of certain enthusiastic specialists, now asking "What is the use of the battleship?" a similar tendency on the part of our own particular theorists who lately raised the cry "What is the use of the cavalry?"

From the ideas expressed by many of your correspondents, they appear to lose the great conception of war and to be led away into technical discussion, which can only lead to confusion of thought. That this is so is, no doubt, the result of the training of naval officers in watertight compartments. The Naval Staff is of too recent a birth to have been able as yet to influence naval thought and to guide it to a wider strategical conception, and to relegate the specialist to his proper sphere.

The Army has suffered from specialist propaganda in France and since, but our General Staff has never been led away from the essential principles. For this reason our Field Service Regulations of 1914 are as sound to-day as the day they were written.

The progress of modern science and invention before, during, and since the war has only tended to modify methods and not to alter principles. Because tanks and aeroplanes were able to usurp the functions of cavalry under certain conditions is no reason that cavalry is obsolete. The profusion and efficiency of the German machine-gun was no reason that our infantry could no longer succeed. Means had to be devised and preparations perfected and lengthened to enable them to succeed as before.

But in this important question of naval construction, the point from which all argument must begin is the destruction of the enemy's battle fleet. All other duties must be subsidiary to this one great object. If the enemy refuses to come out and fight, he must one day surrender or sink himself. No one could suggest that the German battle fleet was afraid to come out for fear of British submarines. It was our big ship that kept him at home, and he knew he must fight it to win. German submarines never prevented our Grand Fleet from moving out when it chose. The battleship must still remain the main fighting unit of the battle fleet: the infantry of the sea. Cruisers, t.b.d.'s, submarines, seaplanes must still remain the auxiliary arms, the means of cooperation, protection, preparation. eyes and ears of the big fighting units; just in the same way that cavalry, artillery, Engineers, and Air Force are the arms that combine to assist the infantry to launch the assault.

Had a little more risk been taken and a little more light been available at Jutland, should we still have heard it asked, "What is the use of the battleship?"

Yours faithfully,

W. S. WHETHERLY.

CONVOYS AND SURFACE SHIPS.

From "Onlooker"

(January 10).

Sir,—There can be little doubt that but for the "convoy system" as elaborated and adopted early in 1917 this country would have been in a very perilous position—*qua* submarines—both as regards food supplies and transport of troops. The "convoy system" could never have been successful unless assisted by surface ships to operate other details in relation thereto. These escorting vessels, whether "large" or "small," could never have kept the sea unless they were supported by a Power who had supreme command of the sea.

To possess such an advantage would necessitate a fighting supremacy in "surface ships" of some sort or other, and the real question would appear to be of what type should such vessels be. For such a world-wide Empire as ours it would seem risky to eliminate "surface ships" and trust to be able to command the seas by some glorified type of a submarine or air craft yet to be evolved!

I am, Sir, yours faithfully,

ONLOOKER.

SURFACE SHIPS AND OTHERS.

Leading Article, "The Times"

(January 10).

The correspondence continues in our columns on the relative merits of surface ships of war and others. It has been confined of set purpose to the more technical side of Navy policy, and has been restrained from spreading out over the whole field of world or Imperial sea power. Even thus restricted, we believe that it has had, has, and will have, clear uses. There is nothing like argument to clear the mind, so long as the argument can be kept to its point. Our correspondents have succeeded in presenting a number of pictures of the future of British sea power. Inevitably, the centre of the discussion has been the capital ship, and as to this monster of naval design two distinct lines of thought have revealed themselves. Both take their material from the war, but the two arrive at opposed conclusions from the same facts. The anti-great-ship men speak of the Grand Fleet as though it had lain paralysed under the shelter of land throughout the war and had been wholly unable to keep the seas, even for a brief cruise. Doubtless they would protest that this is an extreme interpretation of their view, but there is no question that they attack root and branch the whole doctrine of inviolability by sea upon which the Navy policy of these islands has been founded for centuries. The school, on the other hand, which upholds that doctrine—with its insistence on predominance in size, speed, and gun-power of

surface ships—maintains it as having been tested by the war, and as having been proved to be sound in the main. "Onlooker," whose letter we print elsewhere to-day, is of this school. He believes that the life of this country during the war was saved by the convoy system, and argues that convoys would have been impossible without surface protection, and that the surface vessels which supplied it "could never have kept the sea unless they were supported by a Power who had supreme command of the sea."

This is the central point of the discussion, which, however, has revealed incidentally a number of facts about warships and their auxiliaries hitherto almost unknown, and certainly far too little understood by laymen. Of such is SIR PERCY SCOTT'S revelation, in his letter to us on Saturday, that the comparatively narrow beam of our great ships, which made them easier to sink, was due to the restrictions of the existing docks and to the lack of money to build new docks. Another sidelight of the same kind is the vulnerability of the great ship to torpedo attack from the air. Many others will occur to those who have followed the correspondence from the beginning. To-day REAR-ADMIRAL HALL maintains once again that in any war at sea—may Providence avert it!—conceivable in the visible future no strength of this country in great ships could "contain" the hostile fleet. The conditions of such a war would be far less favourable to the British Fleet, however strong in capital ships, than those of the last war. Then, the German High Seas Fleet could be bottled within its harbours. This would not be possible again. The wider the range of a sea war, the greater the handicap on the capital ship. Her staying power at sea is limited; her speed depends on her fuel resources; she cannot both keep the sea for days and be all the time at the full pitch of her fighting capacity. Leviathan, in other words, has weaknesses inseparable from great size, and power of gun and engine-room. And the argument of those who reiterate these disadvantages of the great ship is that the immense expense of her imposes starvation upon experiment, and upon the development of less imposing subsidiary craft, especially those designed to do their work under the surface or in the air. In their belief, the "mammoth surface vessel" is an obsolete relic of out-of-date conditions of sea warfare. Her size alone, they assert, preserves her hold upon the credulity of Admiralty and public, sterilizes imagination among warship designers, prevents comprehension of the changes that have moved upon the face of the waters of the world when battle is toward. Before such a difference between the experts, lay opinion is baffled. That is why we have been critical of the Government's determination to entrust the duty of decision to a committee mostly political. SIR

PERCY SCOTT put into blunt words on Saturday his conviction of the unfitness of this committee for its task. His contemptuous verdict upon it reflects the opinion, we believe, of most sailors and of the great bulk of the nation.

THE DANGER IN THE AIR.

From Mr. G. Holt Thomas
(January 11).

Sir,—The argument for the necessity of building capital ships or not seems to me to have been considered—although other means of defence have been mentioned—too much from the naval point of view. Is not the question at present rather as to whether we can afford to build capital or any other ships? If there is no likelihood of further wars we require neither Navy, Army, nor Air Force; but as we are spending hundreds of millions on the Services, we may presume that this is not the position. More than 10 years ago I stated that the nation without an Air Force would be hopelessly beaten in time of war, and I think the war itself has fully justified every statement I made at that period. Your correspondents have given us details from time to time of what other nations are doing in the establishment of aerial services, which will undoubtedly maintain pilots, constructors, design, research, mechanics, &c., all going to prove, although I think no one requires convincing on this point, that the first danger to this country in the future will be aerial invasion, against which neither Navy nor Army will be of the slightest use. Every Cabinet Minister has publicly stated that we must be supreme in the air, and if this is to be the case we certainly cannot afford capital ships or otherwise.

If I am correct in my argument that this matter, or any other matter connected with defence or offence, has to be considered as a whole and not in regard to any particular Service, it will have to be remembered that whilst the Navy or Army can perhaps be judged in the light of past events, it is impossible to judge the Air Force in the same way, as the possibilities of what aircraft could do in the war were never in any way realized; we merely touched the fringe of aerial possibilities. The policy I advocated in 1914 was considered impossible, and so in 1915, 1916, and 1917; but we must take our minds back to 1918, when a huge aerial campaign was projected, under the able guidance of Lord Weir, at a time when materials for all branches of the Services were short; at a time when every able man in the country was called up and our workshops filled with women. We must also remember that this enormous campaign, when aircraft practically had priority over everything else, never came into being at all, owing to the Armistice.

In considering, therefore, how the money at our disposal—and we certainly cannot afford

more than present Estimates—can best be employed, we must consider very carefully what would have been the effect of Lord Weir's programme if it had come into being. We must even go back further, and consider what would have been the effect on the shortening of the war, or the winning of it, if such a programme had been adopted in 1914, or in the early part of the war. It must be remembered that the Americans, when they joined the Allies, may almost be said to have concentrated on aircraft. Personally I have no doubt at all as to the effect on the war if we had come definitely to the conclusion that it must be won in the air. By this, of course, I do not mean that aircraft could have won the war alone, but that it would have been the decisive factor at any time if we had decided on aerial supremacy. What we did until Lord Weir's programme was evolved was to just keep up with the Germans, very often much behind them. I had no difficulty in convincing the Prime Minister as to the soundness of my views, which, as I say, came into being at a much later date, under much more difficult circumstances.

The question we must ask in reference to capital ships and that we can answer is:—Is it possible to build aircraft to drop 10-ton bombs and so on? The answer is in the affirmative. I am not, of course, advocating a huge expenditure, in times like these, on the maintenance of an enormous Air Force, but we shall have to take steps, and immediate steps, to counteract in some way the great menace to this country of multitudinous Air Services established in other countries, thus maintaining aviation in the best possible way, at the least cost, and with very great benefit to the trade of such countries.

So far as we are concerned, we have to remember that Great Britain is the most unsuitable place for aerial services, on account chiefly of the short distances which could be traversed, and partly on account of our climate. But the British Empire as a whole is the finest field in the world for this development; and owing to the great distances between the most important centres of the Empire, and the dimensions of British trade, the development would yield far greater benefits than to any other Empire or country. Over the worst route possible—namely, between London and Paris—it has been proved that a service to scheduled time is perfectly feasible, at prices which, taking the great advantages rendered into account, are perfectly commercial. But the results over this route would be nothing compared to the development of such routes as Cairo to India, to Australia, Africa, &c., where the flying conditions are known, are more settled, and the difficulties easily met.

It seems to me that great ships, or little ships, large armies or small armies, Air Force and aerial services, must all be considered as a

whole, and such money as we can afford to spend be allocated in the best possible way, taking into account the importance of each item. I have no doubt that the importance of aviation to the British Empire, taking into account the fact that its great possibilities have never been really tried out, and taking into account the fact that the science of flying is new, that the good designers are few and far between, and that research, experiment, and design must be maintained at all costs, is not fully appreciated or sufficiently considered in reference to such a question as capital ships, and the money available for both.

I am, yours faithfully,

G. HOLT THOMAS.

THE BACK-BONE OF THE FLEET.

From Admiral A. W. Waymouth
(January 12).

Sir,—Sir Percy Scott's comments on my remarks in *The Times* are very disappointing. He, as a target expert, talks of having riddled me; but none of his shots is a bull's eye—in fact, he is hardly on the target at all. In regard to the diving battleships, his argument is that he has a design on his table and that an eminent shipbuilder says the scheme is workable. The public may rest assured that that is as far as it will get, for however stupid, as he himself asserts, the Admiralty may be, they will not be stupid enough to adopt a monstrosity that could only dive in the open ocean and when submerged is of no use at all. I notice that the flying battleship he leaves severely alone. No doubt he is satisfied as to the absurdity of that suggestion.

The next point is "roofed-in harbours." I am quite aware that the Germans had roofed-in shelters for submarines. That is quite a different proposition from "roofed-in harbours" for battleships, which is another quite impracticable and absurd suggestion. All airships have a roofed shed, and it is not beyond the bounds of possibility to make the roof bomb-proof, and can in no way be brought in as an argument for roofing in about four square miles of harbour to protect a fleet of battleships from bombs and torpedoes. The remedy is, as I have already said, in the construction of the battleship herself, by deck armour for protection from bombs and plate defence for protection from torpedoes.

The last point is the torpedo to carry a ton of T.N.T. Here again we are told that Sir Percy Scott has a design on his table, that these absurdities can be steered from the air, and that a high official in the Air Service tells him that there is no limit to their size. Even if all this can be done (which I doubt), it would be quite impracticable to carry them on board ship or in

submarines with an attending airship to control them. Such torpedoes could only be discharged from specially built stations, which could easily be located and avoided.

Having left the rope to me I will take the end and Sir Percy Scott can have the noose.

Yours truly,

A. W. WAYMOUTH.

USES OF BATTLESHIPS.

From "Captain, R.N." (January 12).

Sir,—As an officer in command of a battleship for two and a half years during the late war, I beg to make a few remarks on the usages of a battleship, in reply to Admiral Sir Percy Scott.

1. That the fact of a battleship or battle squadron in being is a necessity to cover the operations of light cruisers, destroyers, and small craft.

2. That a modern battleship or battle squadron escorted by destroyers can proceed from any port to any other port, and impose its will on any enemy, subject to the limitations of (a) meeting a superior battle squadron; (b) clearing the minefields in its path.

3. That a modern navy without a battle squadron would be like a modern car without a back axle. It simply could not exist.

With regard to the menace of submarines and aircraft, they can be countered; and with regard to submarines, they were successfully countered in the late war; with respect to aircraft, the counter is obviously increased anti-aircraft guns and our own aircraft. The tremendous progress and menace of aircraft should be thrashed out by practical experiments, and the policy of a separate air force entirely as a naval unit carefully considered. If this is not desirable, the problem of the defence of the British Empire should be considered as a whole and not in watertight compartments, the remedy being the closest cooperation between the sea arm and the air arm, as it was between the land and air forces.

I write as a seaman who has been fired at by submarines, and had bombs dropped in unpleasant vicinity from the air close to my ship, but though I have wholesome respect for both submarines and aircraft, I have unbounded confidence in the future necessary rôle of the battleship, without which we could not exist as a nation in any future war. That we should decline in our pre-eminence as a leading sea Power seems unthinkable, though it is obvious that with all said and done we can only, not scrap the lot, but reconstruct up to date, and scrap the rubbish. This, no doubt, is the Admiralty policy, and will be the policy of the nation, guided by its Government.

I am, Sir, your obedient servant,

CAPTAIN, R.N.

"INSANE" NAVAL COMPETITION.

From Admiral Sir Cyprian Bridge (January 15).

Sir,—Please do not suppose that the naval officers who find it impossible to concede the extreme claims put forward by the advocates of the submarine are not heartily in accord with you in what is your main purpose in permitting the case of the "capital ship" to be discussed in your columns. It is evidently your wish that there should not be an insane—there is no other word for it—competition between nations in adding to their naval armaments. Though as to this the members of the material school may be against you, the members of the opposite—the "fighting"—school will be on your side.

Our shipbuilding policy for the last eight or 10 years before the war was characterized by two things. It was an effort to make our individual ships bigger than those of any rival, and it was accompanied by an enormous increase in expenditure; an increase, moreover, that was bound to go on mounting higher and higher. As was foreseen by those who mistrusted the policy and who felt sure that our rivals would not allow themselves to be defeated "on the building slips," other nations imitated our procedure—so exposed are navies to infection when megalomania is raging in any country. We had to go on turning out ships ever bigger and bigger and, of course, more and more costly. Other people, somehow or other, contrived to find the money to equal or surpass us in each successive step of a shipbuilding scheme which was dominated by the prevalent megalomania. The result was that—as far as relative strength went—we were left just about where we started; and this after we had spent (may one not say squandered?) tens of millions of pounds. That was where the predominance of the material school had landed us.

Now, whatever else may be said of them, the submarinists, the out-and-out advocates of a submarine policy as being the all-conquering element of the future, the submarinists are simply members of the material school. They belong, indeed, to its extreme section, to—if they will pardon the parallel—the Bolshevik section. They are out for the dictatorship of the "materialate"—a handy term which ought to have been coined before this. You must have noticed that they never attach the smallest importance to the human element of what, presumably, is meant to be a fighting force. They do not even mention it. As for strategy and tactics, they not only ignore, they seem to be unaware of, the existence of such matters. They are promising us under-water craft ever increasing in size, just like the "Dreadnoughts" of the pre-war era. Their principal weapon, the torpedo, is to be made bigger and bigger, and it is to have a larger and larger explosive charge—they already measure it blithely by the ton—

just like the shell of the heaviest and (when war broke out) latest naval gun. They are not at all averse from giving "protection" to their already pretty big submarines, and show no disinclination from doing this by passive defence—which can hardly be other than armour of some kind, which must increase the size and cost of the craft to which it is applied. Submarinism is obviously no cure for naval megalomania. It is merely megalomania breaking out in a new place. In your effort to prevent nations from again making fools of themselves by engaging in a mad and extravagantly expensive competition in naval armaments, you will get no real help from the submarinists. If you trust to them, they will "let you down" as sure as you are alive.

The orthodox members of the material school naturally adhere to their distinguishing doctrines. They, also, make no allusion to the human factor. The root of their faith is that you can make war without fighting. You ought to conquer the enemy, not on the field of battle, but on the building-slip. Victory, in their view, will go to superior bigness and superior length of purse—a nice look-out for the taxpayers; but when did the material school ever consider them? The materialists' notion of getting the better of hostile submarines or aircraft is by adding to material—putting on another bit of armour here, another bit of armour there; of course, adding to size and cost of ship.

It is probably not an over-bold thing to say, but the only way of achieving what you desire, and what the great majority of level-headed people will also desire—viz., abstention from wasteful "cut-throat" competition in naval armaments—is to insist on the expulsion of megalomania from naval policy, and the adoption, in naval shipbuilding and armament, of procedure dictated by strategic and tactical considerations, and by nothing else. If you can bring that about you will soon find that it will not be the biggest fleet that the taxpayers will consent to pay for which navies will aim at having, but the smallest which can do the work required from it. Similarly, it will not be the most enormous and costly individual ships which naval architects and engineers can design that navies will ask for, but units as small as their employment in war will justify. If any leading navy adopts these principles, you may be certain that the others will follow suit.

Your obedient servant,
CYPRIAN A. G. BRIDGE.

THE CULT OF THE GREAT SHIP.

From Admiral W. H. Henderson
(January 15).

Sir,—In my letter on January 4 I endeavoured to impress on the nation and its

leaders the danger of committing ourselves too readily to a programme of construction of the existing type of capital ship, not only because of the great expenditure it will involve but also because I believe the existing type is obsolete and valueless for the purposes of any future war which can possibly be conceived.

There are three aspects of the question—financial, international, and naval—which I place in order of their immediate importance. With the financial is interwoven all questions concerning the future of domestic politics, which require careful pilotage if shipwreck is to be avoided. Our international policy is not yet defined; it cannot be till after the meeting of the Imperial Conference in the summer, and the terms of the revision of the Anglo-Japanese Treaty are determined. Both these aspects call for delay before embarking on any programme of big ship building.

As to the naval aspect, I have no knowledge whatever of the proposals put forward by the Admiralty, but the Government, on whom the final decision rests, should bear in mind—and I say this without meaning any disrespect—that the cult of the big ship is still predominant in higher naval circles. Cultivated to an extreme during the 10 years preceding the war, it is maintained by the fact that no captain is promoted to the active list of flag officers unless he has commanded a capital ship. The psychological effects of this on naval opinion can easily be appreciated, when it is understood there is only one line of approach to the Flag List.

The nation must not be lured into the belief that the existing or any type of capital ship can be made anti-torpedo proof. The history of all weapons is that no sooner has the defence met the offence than the latter again overcomes the defence, and a point is reached when any particular form of defence becomes unpractical. This is now the case with the existing type of capital ship. A new form must be devised to meet present naval conditions.

W. H. HENDERSON.

THE FLEET AS AN ORGANISM.

From Mr. John Leyland
(January 17).

Sir,—Shall we not gain a clearer vision of the vital subject which is being discussed in your columns if it be realized that the battleship and battle-cruiser, which have hitherto been, and perhaps must continue to be, regarded as "capital ships," because of their capital importance, are, after all, but parts of an organic fleet, which also includes light cruisers, destroyers, submarines, aircraft-carriers—for a fleet without aircraft is partially blind—and other special vessels?

From the views of distinguished officers, whose opinions carry the utmost weight, it is

evidently conceivable that the existing "capital ship" will not only change its character, but may also be changed in its relative importance. Admiral Henderson thinks the "capital ship" may become a 10,000-ton cruiser. Sir Percy Scott and, apparently, Rear-Admiral Hall consider that the big ship will cease to be "capital," and then surely the submarine or other agency would become the capital unit. Mr. Holt Thomas would have us believe that this supreme element of sea power will not be in the water at all, but will be an aircraft. He implies that if we are supreme in the air we shall not need to be supreme at sea. "We certainly cannot afford capital ships," he says, referring to the big ships, while admitting that Lord Weir's programme, upon which his contention is built, did not actually "come into being."

We shall get nearer to the root of the business if we understand that the duty of the capital unit is to command the seas, which is no mere phrase or figment, but a very practical matter. Our communications must be commanded, and the communications of the enemy must be interdicted. We must be secure at home, and the Empire must be secure. We must have food, raw materials, and trade in a large sense. If it be necessary to send an army, say, to India, that army must be safeguarded with all its communications and supplies. Battleships, like their predecessors, the ships of the line, have usually commanded the sea—that is, communications at sea—by grasping the ends of the lines of communication. That has been their "capital" importance. Many of your correspondents naturally find it difficult to conceive that the Navy can ever be destitute of big ships; as well might an army be without its heavy artillery. May it not be the fact that the capital units of the future will not all be big ships, that there may be some change in relative values, and that other types of vessels may be required for the protection of communications on the high seas? When one considers questions like these one realizes how extraordinarily difficult is the problem now before the Committee of Imperial Defence. A fleet is organic, not only in itself, but in its dockyards, bases, ship-building establishments, gun and torpedo factories, and armour-plate works. Neither the fleet itself nor these resources can exist in stagnation.

The air attack has introduced new elements into the problem, and investigation and research must go on ceaselessly. Lord Jellicoe, in his last volume, left no doubt on this point. There must be constructive policy and not mere destructive criticism. The latter is pessimistic, and I well remember Lord Fisher saying to me that the world had no room for pessimists. I am induced, in conclusion, to refer to another point in Mr. Holt Thomas's letter. He makes the amazing statement that when the Americans came into the war they may almost be said to have concentrated on aircraft. This is not at

all what Admiral Sims would tell him. They came to these islands chiefly concentrating on the destruction of submarines by means of destroyers, chasers, depth charges, directional hydrophones *et hoc genus omne*. They gave the right place to aircraft, and have continued to do so, by keeping them attached to the Service to which they belong.

Yours faithfully,

JOHN LEYLAND.

THE FIGHTING-MASS.

From "An Old Soldier"
(January 17).

Sir,—I do not pretend to expert knowledge of naval matters, yet would I adventure a reply to Sir Percy Scott's question, "What is the use of a battleship?" To me the answer seems clear enough. The use of a battleship is to fight, with reasonable chances of success, the most formidable vessel the enemy can oppose to it. Battleships are to naval forces what the "fighting-mass," "mass-of-mancœuvre," or "mancœuvre-body" (call it what you will) is to a military force. You can obtain decisive results only by administering a heavy shock, delivered by a mass for which the opportunity has been found or created by the cooperative operations of lighter elements engaged in services of reconnaissance and protection.

"What is the use of a battleship?" is merely an academic question, and when, if ever, it has been answered to Sir Percy Scott's satisfaction, we shall still have as far to seek for an unimpeachable reply to another question of more practical importance—namely: "What shall be the nature of the future battleship?" A sword-fish may kill a whale, or a swarm of angry bees may rout a company of the Guards, yet it does not therefore follow that the cetaceans should commit *felo-de-se*, or that armies should be disbanded. An issue of gauze veils would suffice to defeat the bees, or an escort of friendly sharks to guard the whale against sword-fish, and the battleship, be she a submersible or a surface craft, requires similar protection, whether stationary or in motion. Properly guarded, the battleship can still accomplish her mission, the destruction of enemy battleships, and woe to the Power which fails to oppose like to like. Neither bees, submarines, nor aircraft can act regardless of the weather.

I am, Sir, your obedient servant,
AN OLD SOLDIER.

BALANCE OF THE FIGHTING FLEET.

From "Escort" (January 18).

Sir,—It may be true that no battleships except those of the latest construction are today "any damned good" or would be in a

future war; but it may equally justly be said that some kind of surface capital ship is the most essential sea-fighting machine to-day, as it always has been. It is suggested that submarines and aircraft between them render the capital ship obsolete; to justify this contention some of your correspondents write as if these weapons had no limits placed to their activities and destructive powers. It is hoped that the considerations outlined below may serve to show that the day of the capital ship is not yet over, submarines and aircraft notwithstanding.

To deal first with the submarine. Before the late war attention had been almost entirely centred on the development of the submarine as a weapon of offence; and what was in reality of much greater importance to the British Empire—namely, the question of how best to meet its threat and defeat it—had been somewhat neglected. Even so, by the end of the war the submarine's powers of offence had been severely limited. Although it was not till 1916 that comparatively efficient depth charges were introduced, the Germans early realized that to employ their submarines against squadrons adequately protected by torpedo craft was to court serious risk of their destruction; and when the convoy system had been properly organized, which was not till the end of 1917, the losses of merchant ships in convoy were reduced to a very small proportion, roughly 1 per cent.

Yet even by 1918 anti-submarine tactics and operations were still almost in their infancy; never again will the submarine start with such a great initial advantage. Methods of detection, location and attack must progress at least as fast as the further development of the submarine. Modern capital ships can be made tolerably safe against the explosion of more than one present-day torpedo; and if torpedoes are to be much increased in size and power, the submarine must ever increase in size to an even greater extent. The submarine will then eventually become so large and costly that she can no longer be lightly risked, while at the same time she will be more vulnerable, and the loss of one of the monster submersibles sometimes advocated would be a serious matter to any belligerent; several destroyers could be built in the same time and for the same money as one of these under-water "Dreadnoughts."

The larger the submarine the slower she will be in submerging and the less suitable for surprise attacks; she must always be comparatively slow and blind under water, and with improved methods of detection it will be easier for surface ships to avoid her area. As to submarines which are to come up and fire guns at surface craft, they can only be effective as gun platforms while on the surface, where they are peculiarly vulnerable to gun fire from fast surface vessels, and they must

necessarily part with a submarine's great advantage and security, which is to attack unobserved.

That aspect of the problem concerned with aircraft is much more difficult to deal with, as we have no actual experience of a concentrated attack by enemy aircraft on a heavy ship or squadron of heavy ships. Were aircraft to be allowed to attack undisturbed either with bombs or torpedoes, as some of your correspondents seem to imagine would be the case, they would undoubtedly be a very serious menace, but every big ship, possibly every small ship and every merchantman, will carry fighting aircraft in a future war; and every squadron will be accompanied by a floating aerodrome. No enemy aeroplanes will be able to attack by daylight unobserved or without having to first evade or destroy the aircraft attendant on the ship, squadron, or convoy attacked. Before any naval action takes place there will be an aerial battle for local command of the air, and that fleet whose aircraft are more successful will have a big advantage.

But no aircraft can adequately protect a convoy or any ships, including aeroplane-carriers, against attack by surface craft; though they will perhaps prove a greater hindrance to submarines than they did in the late war. To attack and destroy a convoy guarded only by submarines and aeroplanes, all that an enemy would require would be some powerful surface vessels with an attendant aircraft-carrier, whose aircraft would engage those guarding the convoy, leaving the surface vessels free to destroy the convoy by long range gun fire. Thus even aircraft-carriers themselves must rely on surface craft for their protection against enemy surface craft.

Scrap your capital ships and you present your enemy with an opportunity to use the most efficient fighting machine of all, to which you have no proper reply. Every sort of fighting machine requires to be met in its own element; aircraft in the air, submarines by mine and depth charge, and surface craft, which operate between air and water, by other surface craft.

Defence against aircraft by gun fire is again a question that is only beginning to be explored. The submarine must always be a great danger to big ships unescorted by light craft—the aeroplane a serious menace to ships or squadrons lacking aerial escort.

It may be said, then, that the submarine will find her chief usefulness in mine-laying operations, and in attacks on unescorted merchant vessels, or warships damaged in action and unprotected by light craft, also in in-shore scouting patrols. Aircraft will perhaps be chiefly useful in sea warfare in scouting; bomb attacks on coast defences and ports, and in destroying or hampering the enemy's aircraft before and during a fleet action, while

themselves endeavouring to carry out the duties of scouting, spotting and bombing the enemy's ships. That side will be able to use its submarines and aircraft to the greatest advantage, and, conversely, to carry out its anti-submarine operations more easily, which succeeds in destroying or immobilizing the enemy's surface craft, and only some kind of capital ship can effect this. A new weapon is most dangerous while it is still a novelty. In the next war neither the submarine nor aircraft will be novelties. It therefore appears safe to assume that for some years to come no nation will gain or hold command of the sea that neglects the most essential and effective weapon of all—namely, some kind of capital ship, much modified it may be; for ultimately it is only with the support of the capital ship that these auxiliary weapons can be most effectively used.

ESCORT.

AN INADEQUATE COMMITTEE.

From Sir William Joynson-Hicks, M.P.
(January 19).

Sir,—I gather that a committee of five eminent politicians and one eminent admiral is sitting to decide the momentous question which many correspondents have for many days discussed in your columns. But surely there is a more important question still. Capital ships or submarines? is one question, but, Both or aeroplanes? is an even more vital one.

I have never professed to be a technical expert in air matters; all I have claimed is to know what the ablest of our flying officers are thinking on the problems of the air. Great as was the effect of the air fighting in the recent war, it is now admitted that it was child's play to what will happen in the next war. The capital ship and the submarine will alike in 10 years' time be at the mercy of the aeroplane. One must not think only of bombs, but consider the advance in torpedo work from the air. Already an aeroplane can swoop down to sea level and discharge a torpedo with absolute accuracy at a battleship more than 2,000 yards away, and the size and range increase yearly. What battleship can hope to hit an almost invisible aeroplane at that distance?

Surely, then, the proper course is to appoint an even more important committee to consult with the Staffs of the three Services, with a view to the allocation of the estimates among them on the basis of modern knowledge and future safety. With a proper Air Force, three-quarters of the Army in Mesopotamia could have been sent home. With two or three aeroplane carriers lying out in the Atlantic, each with 100 machines on board, the blockade of the Continent could be effected far more easily than by a fleet of battle cruisers. I could multiply instances, but I have said enough to justify my claim for a

far more urgent discussion than that merely between the capital ship and the submarine.

Yours, &c.,

W. JOYNSON-HICKS.

RELATIVE FIGHTING VALUES.

From Mr. Rollo Appleyard
(January 19).

Sir,—We are concerned with the ever-changing *relative* characteristics for defence and offence, and with definitions of the submarine and the surface ship. It is common knowledge that the submarine before and at the beginning of the war was in many respects inferior to the submarine against which the surface ship had to contend in 1918. It may be conceded that the next decade will bring about improvements in the submarine, but we are not justified in assuming that the future submarine will possess *relative* fighting qualities altogether superior to those of the future surface vessel, taking into account speed, endurance, offensive and defensive power, and manœuvring capability. The same remark applies to aircraft.

To-day, with the facts of a mighty war arrayed clearly before us, the broad issue is plain. We ought to build to the designs that were found most effective towards the end of the war, modified only in respect to such subsequent developments as have been proved under seagoing conditions to be improvements. The most illuminating and the most neglected fact of the war is the successful defiance of the submarine by the fast mammoths of the mercantile marine. These surface vessels presented a huge target to the enemy. But they brought us food, they brought us guns, they brought us the American troops, and they brought us victory. This was because they were fast and organized. A single mammoth was worth dozens of the average surface vessel. It is unnecessary here to enter into a description of the method of organization for defence, but it is a fair inference that, with suitable organization, a big fast battleship has as good a chance of holding its own against submarines and aircraft as has a big fast mercantile vessel.

Another fact that bears upon the present discussion is that a submarine is of all types the most unsuitable to accompany a convoy. It cannot keep station. Or, otherwise expressed, mercantile vessels in convoy cannot in general see an escorting submarine, and consequently they can neither keep station with him nor keep clear of him. The result is, there is every chance of a collision. When they do have some indication that a submarine is in the vicinity they are in a dilemma, not knowing whether an enemy or their escort is thereabouts. The submarine is in a still worse plight, for he does not know whether his convoy will treat him as a friend or destroy him as an enemy.

Again, there is the fact that, although aircraft had a favourable chance to destroy thousands of surface vessels, they never did sufficient damage to cause general alarm for the safety of our ocean-going ships. If by some process equivalent to collusion the conflicts could all have been restricted to the tranquil surface of a small inland lake in the broad light of day, aircraft might have modified the surface ship proceedings. But the sea is at least a hundred million miles in area, its surface is often ruffled, and the atmosphere above it is frequently unsuitable for aircraft operations. Moreover, aircraft can be dealt with by their opposite numbers, and it was found possible to restrain their powers of destruction over ocean areas.

Let us not be afraid of our prospective submarine and aircraft enemies. They will be more nervous than we. There is a natural desire to build vessels that shall be safe against all dangers; but experience and calculation prove that within the limits prescribed by cost and time it is impossible to construct vessels that are at once invulnerable and adequately destructive. So we must either fall back again upon the skill and courage of the sailor, or be prepared to starve. This may serve to remind us that in warfare against submarines every British and Allied ship afloat becomes part of the Navy. Consequently the link between the Royal Navy and the Royal Naval Reserve must be strengthened, and every British sailor must be regarded as a naval unit. In addition, to retain command of the sea, every mercantile vessel must be prepared in peace time to carry defensive armament in the event of war, and they should be built for comparatively high speed and quick turning capabilities whenever it is practicable.

I am, Sir, your obedient servant,
ROLLO APLEYARD.

JUTLAND AND AFTER.

From Lieutenant H. Grenville Wells
 (January 20).

Sir,—Sir Percy Scott asks, "What is the use of a battleship?" The answer is, "To provide a means of conveying offensive power to any part of the world by sea." The Power in possession of a superior number of these much-discussed vessels is evidently going to be respected over any international bickering such as oilfields. No modern battleship of English or German design has been sunk by a torpedo.

Submersible battleships are frequently talked about, but consider what is involved in constructing a submersible equal to the Dreadnought—i.e., 10-12-inch, a torpedo armament, and a surface speed of 18 knots.

1. To be completely submerged, she will require 10 fathoms.

2. To be safe from annoyance, she will have to submerge to 180ft., *plus* her own depth—i.e., her keel will be 240ft. below water.

3. In view of 2, the construction of the pressure hull will have to be very massive.

4. How, if the premise is to be satisfied, are you going to provide battery power?

5. It might be possible to design a vessel on flat-fish lines, but any schoolboy will tell one that to resist the heavy pressure of, say, 100ft. depth, very strong, and therefore very heavy, construction would be necessary.

6. My final conclusion is that the submarine has reached its limit in size, but is now more than ever a useful auxiliary.

Torpedoes carrying one-ton bursting charges have been mentioned. This is quite feasible; but, at Jutland, out of 107 German torpedoes, only one hit. One may be permitted to ask if it would not be better to carry a larger number of smaller weapons. One quarter of a ton hitting would be better than a ton surprising the globigerina of the Atlantic depths.

Torpedo-carrying aeroplanes are much boomed. They are a practical weapon, but there seems to be an impression that the helpless (?) battleship or cruiser would not see them or fire at them. This is absurd, as the plane must come low before she can drop her child (20ft.) and, without a direct hit, could be effectually countered by a barrage of splashes put up by director-controlled 6-inch or 5-inch guns. The said splashes are about 60ft. high.

The submarine has been unduly glorified. It is a good weapon, but its potentialities as a weapon of war as opposed to a commerce-destroying career have been misrepresented. The most conspicuous success attained was by the U-boats in the sinking of the Nottingham and Falmouth, light cruisers, and in each case more than one torpedo was required. No good purpose is served by the idolators of the submarine in quoting Cressys, Formidables, and so on, as they were of the pre-Dreadnought death-trap design.

If such a calamity as war between Great Powers occurs in the next hundred years, I earnestly recommend students not to think of naval war as being carried out in puddles in a perpetual calm, but to try to adjust their mental outlook to the vast expanses of the Atlantic and Pacific and to really bad weather in the open ocean. Think in terms of the next possible war. Remember the oceans are wide. Remember submarines are comparatively useless in half a gale in the open. Remember aircraft are still in their childhood, and don't expect them to do the impossible (weather again). Remember that modern methods of ship construction have countered the torpedo. Remember that bomb-dropping is a game of chance; a large ship looks remarkably small from 2,000ft. up. Remember that, in addition to being able to move quickly, a surface craft can and will hit back.

H. GRENVILLE WELLS.

AIRCRAFT AND TORPEDOES.

From "Sea Service" (January 21).

Sir,—In a controversy such as now raging in *The Times*, "Great Ships or —?" many exaggerated statements are made, but I cannot recall any quite so exaggerated as that in the letter of Sir W. Joynson-Hicks in to-day's issue —i.e., "Already an aeroplane can swoop down to sea level and discharge a torpedo with absolute accuracy at a battleship more than 2,000 yards away."

The torpedo is not a weapon of absolute accuracy. Its accuracy depends on the correct judgment of the course and speed of the target. It is easy to calculate the distance a torpedo will miss the point aimed at for every knot error in estimating the speed of the target at any range. A very small error in estimating the speed of the target will cause a ship of 700ft. long to be missed at a range of 2,000 yards. Further, the time taken for a torpedo to travel 2,000 yards gives a ship with the turning capacity of our capital ships ample time to alter course and avoid a torpedo. A torpedo-carrying aeroplane is not almost invisible at 2,000 yards, and when in the act of firing a torpedo it is in the easiest position to be hit by gunfire. Any well-trained crew of a battleship should have an excellent chance of hitting a single or even two or three aeroplanes attacking with torpedoes. Has Sir W. Joynson-Hicks any idea of the size an aircraft carrier would have to be to carry 100 torpedo-carrying aeroplanes? Our present great ships would be completely dwarfed by such a huge vessel. Would such a great vessel be able to lie in the Atlantic unless protected by other naval vessels, including the much-discussed capital ship? As an ex-torpedoman and aeroplane pilot with the greatest belief in the future of the aeroplane and the torpedo, I regret that claims for them should be made of such exaggerated powers, which when not attained will bring these weapons into disrepute.

Yours faithfully,

SEA SERVICE.

A FLEET "IN BEING."

From Vice-Admiral Mark Kerr
(January 22).

Sir,—The use of the battleship was exemplified in the last war. The Germans wished to destroy our sea communications, and if they had done so the Allies would have lost the war. To do this they wished to sink our cruiser squadrons, who were guarding the trade routes and capturing the merchant ships of the Central Powers, and, in addition, were wiping out the German raiders who were preying on our trade. For

this purpose it was necessary for them to send out large cruisers to all the oceans, who would sink our cruiser squadrons and turn the tables on us. Before this could be done the British battle-cruisers must be got rid of, or they would again turn the tables by sinking the large German cruisers before they had accomplished their task; but the battle-cruisers were backed by the Battle Fleet, and until the Battle Fleet was beaten the ships of the Central Powers must needs disappear and leave the ocean routes to the Allies. As the British Battle Fleet was twice the size of the German, the latter tried to decrease the size of our Fleet by torpedo warfare, which they hoped to effect by tempting our ships into their infected waters. Admiral Jellicoe was too old a bird to be caught by chaff, and the Huns' plan failed. I think the above will make it clear to anyone what is the use of a battleship, and that a battle fleet "in being," even if it never fires a shot, may be the principal factor for victory in a war.

It is not necessary, however, to have too much of a good thing. We have sufficient battleships for European waters, and to attempt to build against the U.S.A. would be criminal waste. At the same time we should not scrap the battleships we have, because we have not yet arrived at a substitute for them in the shape of submersibles with a large range of vision, great surface speed, and, above all, quick submersion with safety, which is one of the most difficult and perplexing problems of the large submarine; neither have we yet got the aircraft that can with certainty cruise in mid-ocean for long periods, carrying bombs and torpedoes sufficient to make her a real menace to communications. All these will, no doubt, come in time, and take their places as the new battleship, battle-cruiser, &c., of the future, but they will not alter strategic principles or tactical truths. Every one knows that great fleas have little fleas upon their backs to bite 'em, and little fleas have lesser fleas, and so *ad infinitum*. This is the case in war, and it does not matter what names you give to fleas; you may call them battleships or submarines, but you will not alter the eternal truths.

To sum up, we must experiment with aircraft and submarines. We must be ready with craft and *personnel* for preserving the ends of our trade routes in safety from submarine attack, as well as from surface cruisers. We must watch the European programmes to see they do not get ahead of us in flotilla warfare. We must keep up what surface craft we have until substitutes have been perfected. In this way great economy can be effected, which may keep bankruptcy from us for a time sufficiently long to enable us to teach the people of this country that if they do not work there will be shortly nothing to defend, and no money to pay any wages with or to buy food.

Yours, &c.,

MARK KERR.

WAR ANALOGIES.

From Commander F. G. S. Peile
(January 24).

Sir,—Sir Percy Scott has been inquiring for some time "What is the use of the battleship?" and strangely enough he draws his analogies to disprove, or rather to assert, that the battleship has no further value in naval war from conclusions drawn from the Great War, 1914-18.

I will begin by asking the question "What is a battleship?" This is not a question that can be precisely answered, as battleships have assumed many forms in the past. The question can only be answered generally by saying that she is a mobile fort whose activities are not confined to one area. From the fact of being mobile she is much more effective but more vulnerable than a fort.

The German battle fleet nearly won the war for the Central Powers by the opportunities given to submarines to disperse in unlimited areas and to cause the proverbial chase for a needle in a haystack. Had we had more British battleships to dispose of, or had the Germans had less, we should have closed up on the German Bight and the Belts (channels between Denmark and Sweden) with our small craft and, aided by the resources of the Empire, we could have so curtailed opportunities for exit that but few submarines would have succeeded in penetrating our offensive measures. In fact, our naval policy was controlled by the existence of an efficient German battle fleet large enough to prevent us from doing as we should have wished to, and the existence of this more or less passive fleet, able to emerge at full strength at all times, prevented the necessary support being given to an active submarine defence in a circumscribed area.

As it was, we were forced back for our defence of trade to the oceans where a submarine was actually traced only by the damage that was inflicted. In consequence our expenditure of energy was almost paralysing. The conclusion is obvious. The Germans proved the value of a battleship. Naval officers are not inefficient, and if there had been a reasonable chance to close up to the German bases and economize forces, this would have been done. As it was, the odds were so nearly laid that various forms of this offensive defensive had many advocates.

Let me take the case *ad absurdum* in two ways to bring out the point. We will first suppose that the Germans had had only land forts, submarines and aircraft. In this case we might have attacked their forts in force with battleships and "luggage" at a moment favourable to ourselves when smoke, gas, aeroplanes, &c., would have enabled us with, say, 500 or 600 vessels of all kinds to engage their defences and to take the necessary steps with subsidiary craft behind these forces to close their exits and also destroy their bases. These plans are

in existence and were feasible except for the existence of a mobile heavy artillery defence, capable of extended action.

On the other hand, let us suppose we had only had a large number of submarines, few or no battleships, and that the Germans had had what I call a normal fleet, i.e., all types. They would have issued in force and proceeded to the trade routes—no doubt through submarine areas prepared for them, but Sir Percy Scott says himself that fleets are hard to attack when cruising at sea. Once on the trade routes—probably seizing west coast islands as bases—they would have stopped all sailings immediately, for the surface warship or auxiliary of moderate speed and capacity is worth six submarines against trade, since one or two shots from a heavy gun at long range suffices to disable any ordinary trader. Our only possible policy would have been a wide dispersion of routes.

I am sure to be accused of not having duly considered the danger to "floating forts" from aircraft with torpedoes. My tentative reply is that there are means and ways for protecting the floating fort or battleship both directly and indirectly, for the design of a battleship is not standardized, it has always been altered to meet conditions; again, aircraft and submarines have their limitations and are also vulnerable against specialized attack. In their case human personality is excessively predominant. This is a point which is often underestimated. Research is obviously the primary need of the moment, but we must bear in mind that all arms are vulnerable. And this is where Sir P. Scott seems to err. Our future building policy must not err. It will be understood that I am only defending the battleship as an essential unit and component part of a fleet made up of various types, including the submarine and the necessary air force.

The Navy exists to maintain communications and to protect trade. I conclude by asking Sir P. Scott how he proposes to carry out these functions in the future against a Power that possesses battleships if we have none?

F. G. S. PEILE.

TORPEDOES FROM THE AIR.

From Sir. W. Joynson-Hicks
(January 25).

Sir,—I have read with interest a letter signed "Sea Service," contravening two statements made in my letter to you on this subject. The statements were that already an aeroplane can swoop down to sea-level and discharge a torpedo with absolute accuracy at a battleship more than 2,000 yards away; and, secondly, that an aeroplane carrier could lie in the Atlantic carrying 100 aeroplanes. I did not say torpedo-carrying aeroplanes. That is an incorrect addition to my statement. Probably half would be small fighting scouts. Before that letter was in-

serted in your paper I submitted it to some of the leading pilots in the Air Force, who informed me that it was well within the mark at the present time, and much understates the possibilities of the near future.

Here is an offer. Let "Sea Service" take a battleship worth £8,000,000, and let me attack it at a distance of over 2,000 yards with five torpedo-carrying aeroplanes, worth at the outside £50,000, and I will guarantee that his ship shall be hit four times out of five. In effect, I adhere to every word of my letter.

Yours, &c.,

W. JOYNSON-HICKS.

NEW POSSIBILITIES OF THE SUBMARINE.

From Lieut. Arthur Coleman
(January 26).

Sir,—The advocates of the big ship will no doubt receive much encouragement from the loss of K.5, but I doubt whether your readers are aware of the general opinion of the submarine officers on the "K" class of submarine. The "K" class is a freak, and has never been popular from a submarine officer's point of view, as they are so hard to dive quickly and take much longer to prepare for diving than all other classes. It is not because of their length or size, as some papers have been suggesting, that they are bad diving boats, for the "M" class, complete with their 12in. guns, are the best diving submarines in the Service, and are just as easily controlled and manœuvred as the small classes, like the "E" and "C" boats.

It may also interest your readers to learn that a new invention has come to light which may render the submarine still more deadly to the surface ship, as it gives the submarine manœuvring powers which were undreamed of a few years ago.

Yours, &c.,

ARTHUR M. COLEMAN.

PROTECTION OF COMMERCE.

From Admiral W. H. Henderson
(January 27).

Sir,—Mr. Rollo Appleyard, in your issue of January 19, makes several misleading deductions from statements which are inaccurate.

The fast mammoths of the mercantile marine brought us neither food nor guns, for beyond their bunker coal they have but very little carrying capacity—practically none.

After the Lusitania had been torpedoed and the Britannic sunk by mine or torpedo, the only ones left were the Aquitania, Mauretania, and Olympic. The Aquitania, after ramming the dock gates at Liverpool after she had been converted into an armed merchant cruiser, was pre-

pared as a hospital ship; this was countermanded; she was then half reconditioned and then laid up. The Mauretania was converted into a hospital ship and used in the Mediterranean until the authorities got frightened, and she was also laid up. The Olympic was, I believe, kept on the Atlantic route all the time, but was always carefully guarded by destroyers when approaching or leaving the United Kingdom.

When at the end of 1917 it was determined, not without some misgiving, to use these vessels, also the Vaterland, renamed the Leviathan, to take their great part in the American trooping movement, they were fitted with eight 6in. guns apiece, this armament and their speed being considered sufficient to enable them to escape attacks from a raider like the Wolf, or even a solitary long-distance submarine. Accordingly, outside the submarine danger zone they sailed independently, but when in the danger zone were each escorted by no fewer than eight destroyers. They did not defy the submarine.

For troop carrying these ships were marvellous, but it was the seven to 10 knot tramp and cargo vessel that fed our people, brought our munitions, and supplied the troops in the field. For these purposes, so far from "a single mammoth being worth dozens of the average surface vessel," a dozen or two dozen mammoths would have been worth nothing at all, or indeed a great deal less than nothing, for they would have burnt enormous quantities of coal which we could ill afford, and endangered the lives of large numbers of seamen, for no purpose whatever.

The big 15 to 17 knot Atlantic liners, like the Baltic, Cedric, &c., which can carry some 10 or 12 thousand tons of cargo, did their bit, but they were only a handful in number compared with the eight-knot ships. In the early days of the convoy system they were sailed independently, because it was thought their speed would protect them, but after a few of them had been sunk, July-September, 1917, they also were brought into convoy and sailed under the ocean escort of a county class cruiser or of one of their own class converted into an armed merchant cruiser. When they carried troops (after April, 1918), they had a battleship with a U.S. destroyer as ocean escort till they met the escort of destroyers outside the danger zone.

The slower convoys had no men-of-war to escort them on the high seas. Two of their own class of about 10,000 tons, and carrying cargo, were attached to each convoy as leaders; they were armed with three 6in. guns and carried the flags of the Admiral or Commodore in command of the convoy, and that of his second in command. The escort came under the command of the leader of the convoy when it joined up. Submarines were never used as escorts—probably never will be, except possibly in part. Had they been the convoys had and will always have

their surface leaders, who would control any attached submarines. There can be no question of a convoy keeping station on a submarine.

According to Ludendorff, the Germans could not even spare aircraft to bomb London properly, and naturally did not use them much against ships, although I believe they hit one or two vessels in the North Sea.

W. H. HENDERSON.

THE ECONOMICS OF DEFENCE.

From Rear-Admiral S. S. Hall

(January 28).

Sir,—I have read very carefully the correspondence on this subject and I find myself wondering what the effect of it all now is on the ordinary reader, who cannot perhaps read between the lines of the various theories put forward, often on quite side issues, and usually without taking the matter to a practical conclusion.

Is it not a primary consideration, however sound the theory, whether we can afford it? Is it, in fact, a practical policy if it is beyond our means?

There has been, I think, a preponderance of letters in favour of a continuation of pre-war naval policy. Instead of a competition with Germany in Dreadnoughts, the exponents of this solution to our naval problem advocate, we must assume, a competition in even larger vessels, requiring more beam, and so larger docks at home and abroad; more aeroplane carriers, light cruisers, destroyers, and submarines to assist them, since they are admittedly of no use without them.

Setting aside the cost of this, which is, of course, quite prohibitive, we should embark upon the next naval war as we did upon the last. But if we repeat history in this way, will not history repeat itself in that our surface fleet being superior to that of the enemy, the latter will embark upon a submarine war on trade? Undoubtedly this is a most probable outcome, but there is unfortunately the added trouble that in any situation that can be named we could not, as in the last war, even distantly blockade the rival surface fleet.

Our trade therefore will still have the submarine menace to compete with, though, as I have tried to show, in a more acute form, but it will be on top of attacks by surface vessels which cannot be blockaded.

Again, as I said before, is this not an absurd situation, and who can say it is not a fair statement of the logical result of continuing to base naval power on capital ships?

It is a pity some retired mandarin of the Foreign Office cannot tell us what are the obstacles to international agreement; or is this too delicate a subject for public discussion? Failing such an agreement, the only obstacle to our adopting a more economical form of de-

fence, as pointed out by other correspondents and myself, is the damage we might suffer if other nations continue to build capital ships.

These ships are often represented as arriving on the trade routes and sinking ships—in fact, whole convoys, as fast as their guns can be fired. Now, in the first place, convoys should never be permitted on routes open to attack by such vessels. The visit and search of a single merchantman is a slow business; the removal of a prize if she surrenders is more so.

In the last war we found that, and that the ship carrying out the work was very vulnerable. A capital ship would never be risked on the job, and if she has light or other cruisers with her to do it, she must all the time keep under way at good speed with her destroyer screens out. The result of this is that the capacity of capital ships to do us harm in this respect is not great, if we have a strong submarine fleet. Once again it is not a question of whether a submarine can or cannot sink a capital ship. Without ever attempting to do so, she compels these valuable ships to go at high speed and to be protected by destroyers. This restricts their endurance and capabilities so much that it is difficult to find a rôle for them except battle, so far as we are concerned. There is no prospect of another effective distant blockade with them as in the last war, and the enemy, if inferior, may and probably will not give battle. If our battle fleet is inferior or arrives abroad in inferior strength it will be wiped out.

The future dominating importance of the air and submarines is as obvious to me as was the change from sail to steam, but I learnt my seamanship from the only standard work, which said steam would never be of use except as an auxiliary, and even proceeded to prove it in weight of coal to be carried, &c. And so to-day we are told the aeroplane is only of use as an auxiliary to the battleship. Of course, it is when we go on spending all our money on the latter and have only one torpedo aeroplane station with soggy machines all over three years old and only 200 h.p. engines which will only just take them off the ground.

What is required is a change of view on the part of the Navy. It should be made to their interest to compete with the capital ship menace if other nations continue to provide them, as we competed with the submarine menace. The target is ten times the size and can only operate on the surface. It is not a very difficult problem; even since the war, without any serious effort, we have discovered further formidable foes for large ships. But it must be the Navy's business; at present it is not. We have no fewer than 14 admirals serving in capital ships, one in submarines, and no Naval Air Service at all. All our young officers are fed on and in battleships; all roads to preferment lead through the battleships.

The case is certainly a strong one for a Minister of Defence, for he could see what will not interest Naval, Military, and Air Ministries in

watertight compartments: that provision of air supremacy first and foremost would abolish all permanent defences at home and abroad; give us a means of competing with attacks on sea trade; be of considerable use commercially on a great many routes in peace time; relieve us of all fear of a vigorous air offensive on these islands or any of our possessions, and form a fine reserve for the army of pilots, observers, and air mechanics that will inevitably be required in the next war.

S. S. HALL.

BATTLESHIPS AND AEROPLANES.

From "Sea Service" (January 28).

Sir,—If you will allow me I should like to reply to Sir William Joynson-Hicks's letter in your issue of to-day.

While fully recognizing the ability and courage of our leading aeroplane pilots, to whom Sir W. Joynson-Hicks says he referred his former letter before its issue, one can only assume that, as is so often the case, the belief in the weapon they use has led these pilots to form very exaggerated ideas of the power of the weapon. Sir W. Joynson-Hicks now gives the numbers and types of aeroplanes his aircraft carrier is to contain: 50 torpedo-carrying aeroplanes and 50 fighters. My former remark still holds good. A vessel huge enough to carry this number and type of aeroplanes would still dwarf one of our largest battleships.

If such a thing were possible, I should be quite happy to be at sea in a post-Jutland capital vessel opposed to five torpedo-carrying aeroplanes, especially if the aeroplanes were limited to discharging their torpedoes at a range of 2,000 yards or over. I am certain that the odds are heavily in favour of the capital ship returning safely to harbour, but very much against all five aeroplanes returning to their aircraft carrier, and if the carrier is unfortunate enough to come within range of the capital ship's guns her chances will be small unless powerfully convoyed.

Yours faithfully,

SEA SERVICE.

On January 29 it was announced in "The Times" (1) that the inquiry instituted by the Imperial Defence Committee was approaching completion; (2) that the sub-Committee, consisting, with one exception, of Ministers of the Crown, would make no final pronouncement for or against the retention of the capital ship; (3) that it would not recommend that no more capital ships should be built; (4) that it would remit further consideration of the question to the meeting of British Ministers and Prime Ministers of the Dominions in June next.

SUBMARINES AT JUTLAND.

From Admiral Sir Reginald Bacon
(January 29).

Sir,—This morning I received from America a newspaper containing an able summary of the discussion in *The Times* on "Battleships or —?" In the interesting editorial there appeared one slip which accidentally threw into fine relief the essential difference between submerged and surface warfare. This statement read: ". . . in the battle of Jutland Lord Jellicoe, by previous arrangement with the Admiralty, turned his ships away from the German Fleet because he did not believe it was desirable to expose them to the attacks of the German submarine fleets which were supposed to be present with Admiral von Scheer."

Now this is exactly what Lord Jellicoe did not do. He did not care the proverbial brass farthing for the German submarines; in fact, when one was reported he merely turned his flagship towards it to kick it out of the way. He did not trouble about the puny assault of slow vessels unable to bring off a combined attack. What did cause watchfulness, and what not merely advised but compelled the "turn away" of four points, was the concerted attack of some 20 or more destroyers which were transporting, at a speed of over 30 knots directly towards his fleet, some 60 or 70 torpedoes, with a view to launching them with precision at his long line of battle. The slow surface speed of a submarine (even our K boats have only a surface attacking speed in a fleet action of some 12 knots), its equally slow submerged speed, its inability to work in combination with its fellows, render its attacks in battle futile, or at least entirely dependent on luck.

We who have lived at sea know how disappointing a place it is, how the unexpected invariably happens, and how rarely the ideal is achieved. Could anything in naval warfare seem more reasonably simple and feasible than the decimation by destroyer attack at night of each of two fleets of battleships that had fought and broken off the engagement owing to darkness and mist? The approximate position of each was known to the opposing destroyers, yet after Jutland Nature intervened, and little damage was done to either side. At sea we fight the forces of Nature as well as the enemy, and these must not be omitted in our forecast of naval warfare.

Some submarine expert may demur to the statement that the 20-knot K class can only attack in a battle fleet action at 12 knots. The calculation is, however, simple. A three-mile steam at 20 knots takes nine minutes to complete. Five minutes occupied in diving brings the total to 14 minutes before the vessel can proceed submerged. This gives her an approximate mean speed of 12 knots.

I am, &c.,

R. H. BACON.

REPLY TO ADMIRAL HENDERSON.

From Mr. Rollo Appleyard
(January 31).

Sir,—The remarks of Admiral W. H. Henderson in your issue of January 27 indicate that the term "fast mammoths" has been interpreted by him in a particular sense to denote only vessels of the Olympic class. In my letter of January 19 I applied it in a more general sense to denote all the bigger fast vessels of the mercantile service that, when organized, baffled the submarine. In effect, Admiral Henderson restricts the issue to the Aquitania, Leviathan, Mauretania, and Olympic. For the purpose of establishing the accuracy of the deductions to which Admiral Henderson refers, it would be impossible to select four better examples. It was our custom to describe ships of this big four as "monster transports." To examine the matter, let us first remember the services of the Olympic and the Mauretania in 1916, when transporting Canadian troops; for in the performance of their share of that great work they made about 12 round voyages as a total for the two ships. In 1918, together with the Aquitania, they brought to Europe about one-eighth of the total number of troops transported from the United States, the total being more than a million. For this purpose they made about 24 round voyages as a total for the three ships. The performance of the Leviathan was no less remarkable. They presented targets of exceptional size, and the enemy had precise knowledge of them from experience gained in attacking the Lusitania and the hospital ship Britannic. The enemy, moreover, endeavoured by every possible means to destroy them, but his efforts were frustrated by organized measures. Admiral Henderson declares that these vessels did not defy the submarine. Defiance is indeed a word inadequate to describe achievements at once so skilful and so dauntless. In any case, as evidence of the fighting chances of the fast surface-vessel in general, and of the surface battleship in particular, the records of their performances will serve for perpetual guidance.

In conclusion, may I be permitted to add a remark with regard to organization? On the personal side, organization of mercantile vessels for war implies central control and universal scope of action. To be effective, such control demands intimate knowledge of and sympathy with the methods of operation of mercantile vessels and mercantile business. This knowledge can only be attained and utilized by harmonious and constant working between the mercantile service and the Royal Navy. On the material side, the whole implies the development of, and provision for, defensive measures to be applied to mercantile vessels in war. The maintenance of this organization in peace is our immediate duty. It demands tact, but it does not call for great expenditure.

In proportion as this organization is developed, submarine warfare will be delayed, and here before us is the greatest opportunity that will ever be offered to us in our time for the maintenance of peace.

I am, Sir, your obedient servant,
ROLLO APLEYARD.

THE MORAL OF THE DISCUSSION.—I.

From Sir James Thursfield
(February 2).

Sir,—The long discussion on naval policy which has been running in *The Times* for so long, has been, in my judgment, full of interest and full of instruction; nevertheless, it seems to me to have gone far to show that the problem is as yet insoluble and must remain insoluble for some time to come. I would make bold to define the problem in the following terms:—What is going to be the capital ship of the future? The capital ship I would define as the *ultima ratio* of naval force, that element of naval force which in the last resort crowns and sustains all the rest. I do not think either party to the controversy would take much exception to this definition regarded as a statement of historical fact. There is no serious dispute about this as a matter of history. But acute controversy arises as soon as we begin to ask, Will this hierarchy hold its own in the future, or will the surface ship of the line be deposed from its pride of place and surrender its supremacy to some other form of naval force, or possibly to some form of aerial force?

This is a very real question, a very vital question. For the present, I think it must be acknowledged that the ship of the line holds the field, not without challenge, indeed, but still with the preponderant weight of instructed naval opinion behind it. That is shown by the fact that the Board of Admiralty is strongly in its favour. It will not be out of place to quote here some of the First Lord's remarks on the subject to be found in his "Notes on Naval Policy," issued with the Navy Estimates of last year:—

There has been some criticism of the maintenance in commission of the present types of vessels, especially in regard to the capital ship. A contrary policy has been openly advocated, this policy being based, it is presumed, on the idea that the battleship is dead and that submersible and air vessels are the types of the future. The Naval Staff has examined this question with extreme care, and as a result we profoundly dissent from these views.

In our opinion the capital ship remains the unit on which sea power is built up.

So far from the late war having shown that the capital ship is doomed, it has, on the contrary, proved the necessity of that type. On the German side the whole of the submarine campaign was built up on the power of the High Sea Fleet. On the British side the enemy submarines in no way interfered with the movements of capital ships in carrying out operations: destroyer screens, new methods of attack, and altered tactical movements defeated the submarine.

Nor at present could the Board of Admiralty subscribe to the statement that aircraft have doomed the capital ship. Aircraft are certainly of the highest importance in naval tactics, as regards reconnaissance, torpedo attacks, and artillery observation, but their rôle in present circumstances is that of an auxiliary and not of a substitute for the capital ship. The past history of this question must be taken into account. Many times has the doom of the battleship been pronounced. The introduction of torpedo craft was believed in certain quarters over 20 years ago to have settled its fate. The Board of Admiralty at the time refused to be carried away by the attractiveness of the idea of building small cheap torpedo craft instead of battleships, and they proved to be right. History has shown that the introduction of a type to destroy the capital ship has been quickly followed by the evolution of counter-measures which sustain its power.

We therefore believe that the battleship must remain the principal unit.

Now it will hardly be contended that this important and considered utterance is the outcome of an obstinate and obstructive spirit of conservatism such as undoubtedly dominated many a Board of Admiralty in the past. The War Staff, indeed, as it exists to-day at the Admiralty, "is largely a war product," as Mr. Long has told us in another passage of his "Notes." One of its chief functions is to establish at the Staff College and to instil into the minds of its students "a common doctrine on strategical and tactical questions, the right application of the lessons of the past, and the ability to foresee the requirements of the future." And again:—

The main consideration on which we have worked in improving the Admiralty Staff organization has been to strengthen that side of the Staff which deals with the use and employment of weapons, the tactical questions consequent on change of weapons, types of weapons, and Staff questions dealing with research and scientific experiment. The Staff view on these matters must be kept in the forefront, otherwise there is danger that requirements of design and supply will dictate the principles relative to use and employment, resulting in the weapon becoming the master and not the servant of the tactician.

Is not this the right antidote to that tyranny of the "materialate"—to borrow the apt and significant expression coined by Admiral Sir Cyprian Bridge—which, as Mr. Long acknowledged in another passage, cost us so dear in the war? And is not the War Staff as good and capable a body of experts as could be found or constituted for the consideration and ultimate solution of the problem under discussion? I do not know where to look for a better.

For be it observed that the solution of the

problem propounded by Mr. Long in his "Notes" of last year is by his own admission merely tentative and provisional. To prove this it will be necessary for me to quote yet another passage from the same document:—

Nevertheless, it must be emphasized that, although the battleship remains, its type may require to be altered. Advances in electricity, in the internal combustion engine, and in science generally, will inevitably necessitate an eventual change of type, and it is one of the principal functions of the Naval Staff to keep continuous watch on scientific development, with the object of ensuring that the type of capital ship designed meets the requirements of the future. It is even possible that the present battleship will change to one of a semi-submersible type, or even of a flying type, but such types are visions of the far future, not practical propositions of the moment. By gradual evolution and development the types forecast may arrive, but the immediate abandonment of the capital ship in favour of a visionary scheme of aircraft and submarines would leave the British nation destitute of sea power and without the means of progressive training.

I am not, I confess, greatly impressed by the last clause of this deliverance. If, when the time comes for us to exert our sea power in war again, we find that the surface ship of the line is superseded by other and newer forms of naval force, it will profit us nothing to have trained our fleets in the tactics appropriate to that unit. Such an argument will remind the opponents of the surface ship of the survival of masts and sails long after these agencies were past all possible use in war, and they will perhaps exultantly point out that we cannot afford to practise what they regard as obsolescent tactics with ships costing from eight to 10 millions apiece. But I can make them a present of that argument, because I hold that in spite of all they have said they have by no means rebutted the cogent plea of the Admiralty of at least the provisional retention of the surface ship of the line. On the other hand, it is clear from the foregoing extract that the Board of Admiralty is already prepared to go some considerable way with them, though it prefers to start from a different point and to go by much slower and more tentative steps. We are to retain the surface ship of the line, but its progressive development "will inevitably necessitate an eventual change of type," and in the far future we are bidden to contemplate the vision of "a semi-submersible type, or even of a flying type." Surely this is all that the opponents of the surface ship of the line need ask for. That type of vessel is at long last to develop either into a ship of a semi-submersible type or into a ship of a flying type. If this process of development leaves some of its units surface ships and nothing more, that can only be because such a type will in the judgment of the Board of Admiralty and its Naval Staff still have its uses. In any case all three types, or at any rate the surviving two of them, will remain capital ships in

the sense I have defined—namely, the *ultima ratio* of naval force.

Your obedient servant,
JAMES R. THURSFIELD.

MORAL OF THE DISCUSSION.—II.

From Sir James Thursfield
(February 3).

Sir,—From my previous letter your readers will have seen that the Board of Admiralty starts from the existing capital ship and proceeds to develop it on lines which lead ultimately, though perhaps only in the most visionary future, to the submersible or semi-submersible ship and the flying ship. That is surely the sound and logical line of development. We cannot afford to scrap the capital ship until we have provided in its place some alternative type—whether submersible ship or flying ship or a tactical combination of units of both types—which is equally qualified to be the *ultima ratio* of naval force, or, in other words, the capital ship of the future. Do the opponents of the surface ship-of-the-line propose to take this incredible and almost crazy course? If not, what is the use of talking about “scrapping the lot”? To scrap our existing capital ships would be, as the Board of Admiralty has said, to “leave the British nation destitute of sea power.”

Be it observed, moreover, that the advocates of such a policy are relying almost entirely, not on the accomplished fact, nor on the teaching of the late war, but on their confidence in a still undeveloped future. Apart from the submarine campaign directed by Germany against maritime commerce—a topic which I am not here concerned to discuss—the achievements of the submarine against ships of war, especially against capital ships, were, in truth, almost insignificant. Not a single battleship of the Grand Fleet was the victim of a submarine. The battleships which fell victims to submarines in the Dardanelles were being employed, as Admiral Sir Reginald Bacon has pointed out, rather as floating forts—and as such exceptionally vulnerable to submarine attack—than as capital ships proper. Again, I would point the very salient moral of Admiral Scheer's experience at the Battle of Jutland. For many days before the battle he had, as he tells us himself, disposed all the available German submarines—the attack on commerce being at that time suspended—in position off the main naval bases of Great Britain in the North Sea. They were to take up their assigned positions by May 23, and then, as soon as the weather was favourable for aerial reconnaissance, he proposed “to compel the enemy to put to sea by making an advance with our Fleet, and to give battle under conditions favourable to us. I hoped,” he tells us, “by these dispositions to bring the sub-

marines into action and at the same time to utilize them for reconnaissance purposes.” Both these hopes were frustrated. For nearly a week he waited for atmospheric conditions favourable to aerial reconnaissance, and at last, when it was impossible to keep the submarines off the enemy ports any longer, he had to put to sea, on May 31, while the atmospheric conditions were still unfavourable. This compelled him to abandon what he regarded as the more formidable of the two plans of operation he had prepared, since he held that for this plan extended scouting by airships was indispensable. Even so, the submarines fulfilled neither of the purposes for which they were employed. They failed to observe the exit of any of the divisions of the Grand Fleet, and such reports as they sent in concerning the movements of individual units gave, as he acknowledges, no indication of the British Commander-in-Chief's intentions. As for their performances in action, either during the battle or before it, they were nil. No British ship-of-the-line was torpedoed on its exit from port, nor during the advance to the scene of action, nor, with one possible exception, during the action itself. As for certain airships which did tardily take the air in the afternoon of May 31, Admiral Scheer records that “they did not succeed in taking part in the action which developed soon afterwards, nor did they observe anything of our Main Fleet, or of the enemy, nor did they hear anything of the engagement.”

These, then, are the agencies, or the parents of the agencies, to which the assailants of the ship-of-the-line propose in the near future to commit the maritime fortunes of the British Empire. Of course, I know that both the agencies in question—the submersible and the aircraft—have developed enormously since the day of Jutland, and are likely to develop in the future at an ever-increasing rate, until at last we come to the semi-submersible battleship, or even to the flying battleship. But these developments are still many of them in the future, some of them in the dim and distant future, and even those of them which have materialized since November 11, 1918, are one and all of them wholly untried in war. They may be capable of all the potentialities which their more sanguine advocates attribute to them, but that is a proposition which is not yet proved, and cannot be proved, in the case of developments not yet materialized. Even as I write, the very narrow escape of R.34 from fatal disaster, following closely on the awful disaster of K.5, should give all of us very seriously to think on this most vital topic. Surely it is only common sense and common prudence in such circumstances to “ca' canny,” to “wait and see,” and not to be off with the old love before we are on with the new. Even as regards the old love there seems to be no occasion to make a runaway match of it, as the Board of Admiralty seemed disposed to do in the autumn until it was brought up stand-

ing by the decision of the Cabinet to refer the whole problem to a sub-committee of the Committee of Imperial Defence.

I may have only scratched the surface of this great subject. The whole nation and the whole Empire are, in my judgment, unquestionably face to face with a momentous and quite unprecedented crisis in the evolution of our naval policy. I will not say that we are at the parting of the ways because the ways have already parted—perhaps never to be united again, except in a new scheme of strategy and tactics scientifically adapted to the new conditions. In the old days never to return again every way led across the sea, and our whole defence lay in surface vessels and in a strategy and tactic slowly and laboriously adapted to the conditions implicit in surface warfare. Now a second way leads under the waves and a third into the air. Who can say whether, in the near or distant future, the command of the air will or will not become more important to us than the command of the sea? Is this a time, then, for us to embark once more on a new programme of capital shipbuilding? If the ships projected by the Admiralty, costing from eight to ten millions apiece, were immediately and imperatively necessary no Englishman would grudge the expenditure involved. But is there any such immediate and imperative necessity? Surely not. We have nothing to fear on the seas from any European Power, now that Germany is disarmed, and probably shall have nothing to fear for a long time to come. So far as I am aware no maritime Power is now building capital ships except Japan and the United States, with one of which we are allied on terms involving no menace to the other, while with the other we are united in bonds closer and more lasting than any which can be made out of parchment. It is true that the situation in the United States is, for the moment, uncertain and obscure, and will probably not clarify itself until after the President-elect is firmly seated in the saddle. That is all the more reason why we should do nothing on this side of the Atlantic to confuse the situation still further on the other. We should think twice or thrice, therefore, and even many times more, before we embark on a new Two-Power Standard of which the determining factors can only be Japan and the United States. Indeed, the thing is really unthinkable.

Where, then, is the need for a new programme of capital shipbuilding? The wise and prudent course would surely be to explore with patience, good will, and candour every avenue which might by any possibility lead to a common understanding between the nations, and only if all such avenues should be found impassable to fall back in despair on the old, ruinous, and provocative policy of international rivalry in armaments—a policy which, as I read the future, must end in the downfall of modern civilization.

Your obedient servant,

JAMES R. THURSFIELD.

A LAST WORD.

From Admiral Sir Percy Scott (February 4).

Sir,—Many people are asking me why I do not reply to the criticisms on my proposals as regards the new Navy. I have not replied for two reasons:—

1. I have not made any proposals as regards the new Navy.
2. I do not think any of the criticisms are worth answering.

Since the war all I have done is to ask the question, What is the use of a battleship? I want to know how we are going to use her if we are at war (a) with France, (b) with a country in the Mediterranean, (c) with a Far Eastern country.

Up to the present no one has been able to give me an answer to this question except the midshipman, who tells me that the battleship is of no damned use. I understand that a committee of politicians, assisted by an Admiral of the Fleet, are now dealing with this midshipman's answer.

The question, so often raised, of battleships or submarines, is in my humble opinion a wrong way of putting it; for I think that it is generally allowed that all countries will decide, or have decided, to use in the protection of their ports submarines and aeroplanes. Therefore, whether we have battleships or not, it looks as if we must have submarines; and if we take into consideration our foreign possessions and colonies, the number of submarines we shall require will be very large and the bill for them heavy.

If this point is allowed, the question is no longer Shall we have battleships or submarines? It changes into Shall we have battleships? and before that question is decided some light ought to be thrown on "What is the use of them?" and it is to find out "what is the use of them" that I have trespassed on your valuable space.

The building of battleships will be supported by all the battleship builders of the world because it is the bread whereby they live. Look what a paying concern it is; would not any of your readers like to get a nice fat contract for (say) only five battleships at 35 millions of golden sovereigns? In these circumstances we must expect the construction of battleships to be backed by many people possessing strong political interest, commercial interest, and the support of capital. We must also expect the necessity of battleships to be supported by all the navies of the world; for naval men do not commit suicide, and battleships are vital to their profession and vital to their comfort. To be captain of a battleship is the ambition of every naval officer. Who else in the world travels about with the same comfort as the captain of a battleship? He has a large drawing-room, a dining-room in which he can seat 25 or 30 guests,

a commodious bed-room with bath-room attached, and spare bed-rooms.

All these points will naturally be taken into consideration, or, at any rate, they will flit through the mind of every naval officer before he decides to vote for "not building battleships." These points will also have to be taken into consideration by the taxpayer when he is asked to put his hand in his pocket to pay for the super-battleships, their nurses and other accessories.

The other accessories must not be ignored, for they mean a lot of golden sovereigns from the taxpayer. Obviously we must have a safe harbour to put our battleships in; they must be immune from underwater attack and from air attack. The super-battleships will necessitate all our docks being enlarged, and a multitude of other expenses, running, I should think, into hundreds of millions.

This, Sir, is the last time that I shall trespass on your space, because I know that no one can answer my question of "What is the use of a battleship?" and I know that we shall not build any more battleships. The Committee of politicians who are now reviewing the question will do what all politicians do, that is, they will do nothing; but later on we shall hear that on the question of battleships the Committee of Imperial Defence have decided not to make known their opinion until after a conference with the Colonial representatives who are expected to come to this country in the summer; or they may wriggle out of it in some other way. I am quite sure that they will not tell the country "what the use of a battleship is."

PERCY SCOTT.

GREAT SHIPS OR — ?

Leading Article "The Times" (February 4).

Ten weeks ago we opened our columns to a discussion on the uses and value of the capital ship in modern naval warfare. The whole question can hardly fail to be raised in the House soon after the reassembling of Parliament, possibly in the debate on the Address to the Throne, certainly in connexion with that on the Navy Estimates. For the convenience of members and others who take a practical interest in its settlement, the various letters and articles which have appeared since the end of November are to be re-published as a pamphlet before the House meets. The correspondence, we venture to think, has already served a useful purpose, though it has led to no definite conclusion. That, however, was not to be expected. The points at issue are too many, too technical, and too dependent on questions of high policy for there to

be any possibility of their final settlement as the result of an open discussion. But the energy of our correspondents, most of them naval officers of long and varied experience, has already been fruitful. They have threshed the matter out from practically every conceivable point of view, they have informed the public on the ends and means in dispute, and it may fairly be claimed that they have aided and, to a certain extent, inspired the official inquiry. SIR PERCY SCOTT, who has played a prominent part in the controversy that has arisen, is still asking "What is the use of 'battleships'?" Those who differ from him might conceivably reply that his attitude is not unlike that of jesting PILATE, who "would not 'stay for an answer.'" But there is a definite purpose in the apparent flippancy of some of his treatment of the subject. He is in deadly earnest, and he is bent on making people listen to what he says. Like SIR JAMES THURSFIELD, he is persuaded that the whole nation and the whole Empire are unquestionably face to face with a momentous and quite unprecedented crisis in the evolution of our naval policy. In his view, the day of the battleship, as we now understand it, is over—at all events as a purely surface ship. LORD SYDENHAM and many of our naval correspondents are just as strongly convinced that to put all our trust in submarines and aircraft would be madness. The balance between these opposing views and the summing-up of the whole correspondence has been admirably stated by SIR JAMES THURSFIELD, to whose long and untiring services as a writer devoted heart and soul to the interests of the Navy our readers and the public owe a great debt. The discussion to which yesterday and the day before he added the weight of his authority, goes, he thinks, far to show that the problem is as yet insoluble. He agrees with the Board of Admiralty that to scrap our existing capital ships would be to leave the British nation destitute of sea power. In the serious accident to R.34 and the terrible disaster of K.5 he sees grave warnings that we ought to "ca' canny," and not be off with the old love before we are on with the new. To his mind the question to be considered is—"What is going to be the capital 'ship of the future'?" For the present the ship of the line holds the field, but "not without 'challenge.'" If the battleship remains, its type, as MR. LONG has acknowledged, may require to be altered; it may change to one of a semi-submersible or even a flying type.

But he exclaims against the idea that this is a time for the country to embark on a new programme of capital shipbuilding, or a new two-Power standard—a policy which, as he reads the future, must end in the downfall of modern civilization. We believe that this is sound truth. England's Navy must be an Empire Navy, ready and able to defend the com-

merce and people not only of these islands, but of the Dominions, the Colonies, and India. But there is nothing to be gained by too precipitate action, with the enormous expense that it might involve. There is still time for the Admiralty and the nation and the Empire to consider the question before deciding irrevocably what is to be the capital ship of the future.



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